SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[*The* MINING JOURNAL *is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.*]

No. 2202.—VOL. XLVII. LONDON, SATURDAY, NOVEMBER 3, 1877. PRICE (WITH THE JOURNAL) SIXPENCE. PER ANNUM, BY POST, £1 4s.

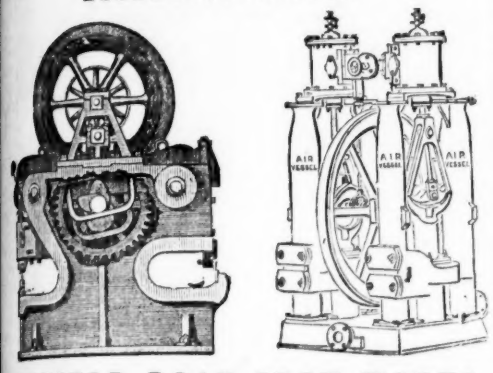
JOHN CAMERON'S

SPECIALITIES ARE ALL SIZES OF

Steam Pumps, Shipbuilders' Tools,

BAR SHEARS.

ESTABLISHED 1852.



OLDFIELD ROAD IRON WORKS,

SALFORD, MANCHESTER.

For Excellence and Practical Success of Engines

Represented by Model exhibited by this Firm.

HARVEY AND CO.

ENGINEERS AND GENERAL MERCHANTS,

HAYLE, CORNWALL,

LONDON OFFICE,—186, GRESHAM HOUSE, E.C.

MANUFACTURERS OF

PUMPING and other LAND ENGINES and MARINE STEAM ENGINES of the largest and most approved kinds in use, SUGAR MACHINERY, MILLWORK, MINING MACHINERY, AND MACHINERY IN GENERAL. SHIPBUILDERS IN WOOD AND IRON.

MANUFACTURERS OF

HUSBAND'S PATENT PNEUMATIC STAMPS.

SECONDHAND MINING MACHINERY FOR SALE,

IN GOOD CONDITION, AT MODERATE PRICES—viz.,

PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES; STEAM CAPSTANS; ORE CRUSHERS; BOILERS and PITWORK of various sizes and descriptions; and all kinds of MATERIALS required for MINING PURPOSES.

LYON & DAVISON,

IRONFOUNDERS, ENGINEERS, &c.,

Haydon Bridge, near NEWCASTLE-ON-TYNE,

Manufacturers of

LEAD SMELTING, REDUCING, AND REFINING FURNACES, SLAG HEARTHS, AND SMELTERS' WORK GEAR.

Plans and Estimates furnished for improved Lead or Copper Mining and Smelting Plant.

ST. LAWRENCE ROPE WORKS,

NEWCASTLE-ON-TYNE. Established 1782.

THOMAS AND WILLIAM SMITH,

Manufacturers of all kinds of Iron; Steel, Copper, and Galvanised Wire Ropes; Hemp and Manilla Ropes, &c.; Round and Flat Shaft Ropes; Crab Ropes; Guide Ropes; Hauling Ropes; and Galvanised Signal Strand; Ship's Standing Rigging fitted complete; Patent Hemp and Manilla Hawsers, Warps, Cordage, Spun-yarn, &c., &c.; Manilla Yarn for Telegraph Cables, and Flat Hemp Ropes for Driving Rods; Steel Plough Ropes; Fencing Wire and Stand Lightning Conductors, &c.

OFFICES—

1, QUEEN STREET, NEWCASTLE-ON-TYNE; DOCK YARD, NORTH SHIELDS; 17, PHILPOT LANE, LONDON, E.C.

STORES—North Shields, Blackwall, Newcastle, and Tyne Dock.

STANDARD LUBRICATING OILS COMPANY, LIMITED.

DARK and PALE OILS for MACHINERY, RAILWAY, and MINING PURPOSES, from TWO SHILLINGS per gallon, and upwards.

AGENTS WANTED.

95, CANNON STREET, LONDON, E.C.

BENNETTS' SAFETY FUSE WORKS,

ROSKEAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING PURPOSES,

Reliable for wet or dry ground, and effective in Tropical or Polar Climates.

W. BENNETTS, having had many years experience as chief engineer with Messrs. Bickford, Smith, and Co., is now enabled to offer Fuse of every variety of improved manufacture, of best quality, and at moderate prices.

Price Lists and Sample Cards may be had on application at the above address

LONDON OFFICE,—H. HUGHES, Esq., 65, GRACECHURCH STREET.

PARIS, BRONZE MEDAL, 1867.

ORDER OF THE CROWN OF PRUSSIA.

FALMOUTH, SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE McKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24·90, 27·60, 24·80, 26·10, 28·30, 27·10, 28·40, 28·70 metres. Total advance of south heading during January was **121·30 metres, or 133 yards.**

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere (7½ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL: and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

These Machines possess many advantages, which give them a value unapproached by any other system of Boring Machine.

THE McKEAN ROCK DRILL IS ATTAINING GENERAL USE THROUGHOUT THE WORLD FOR MINING, TUNNELLING, QUARRYING, AND SUB-MARINE BORING.

The McKEAN ROCK DRILLS are the most powerful—the most portable—the most durable—the most compact—of the best mechanical device. They contain the fewest parts—have no weak parts—act without SHOCK upon any of the operating parts—work with a lower pressure than any other Rock Drill—may be worked at a higher pressure than any other—may be run with safety to FIFTEEN HUNDRED STROKES PER MINUTE—do not require a mechanic to work them—are the smallest, shortest, and lightest of all machines—will give the longest feed without change of tool—work with long or short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or open work. Their working parts are best protected against grit and accidents. The various methods of mounting them are the most efficient.

N.B.—Correspondents should state particulars as to character of work in hand in writing us for information, on receipt of which a special definite answer, with reference to our full illustrated catalogue, will be sent.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL, IRON, AND FLEXIBLE TUBING.

The McKean Drill may be seen in operation daily in London.

McKEAN AND CO.,

ENGINEERS.

OFFICES,

5, RUE SCRIBE, PARIS.

MANUFACTURED FOR McKEAN AND CO. BY MESSRS. P. AND W MACLELLAN, "CLUTHA IRONWORKS," GLASGOW.

The Warsop Rock Drill

(Involving an entirely new principle in Mechanical Boring)

Requires only 20 lbs. steam or air-pressure.

Has only two moving parts—thus ensuring freedom from derangement, and is absolutely self-feeding.

Is excessively light, and can be carried by one man, who can with the **No. 1** size (weighing only 35 lbs.) drill **40** holes ⅞ in. diameter and 1½ in. deep per minute, in the hardest Aberdeen granite for splitting purposes.

WARSOP AND HILL,

HYDRAULIC AND GENERAL ENGINEERS.

NOTTINGHAM.

STEAM and HYDRAULIC WINDING and PUMPING ENGINES of all kinds.

DUNN'S ROCK DRILL,

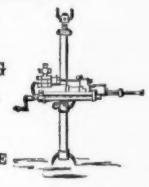
AND

AIR COMPRESSORS,

FOR DRIVING BED ROCK TUNNELS, SINKING SHAFTS, AND PERFORMING OPEN FIELD OPERATIONS,

IS THE

CHEAPEST, SIMPLEST, STRONGEST, & MOST EFFECTIVE DRILL IN THE WORLD.



Dunn's Patent Rock Drill Company

(LIMITED).

OFFICE,—193, GOSWELL ROAD

LONDON, E.C.

THE

PATENT SELF-ACTING MINERAL DRESSING MACHINE COMPANY

(LIMITED).

T. CURRIE GREGORY, C.E., F.G.S.

OFFICES,—GLASGOW: 4, WEST REGENT STREET.

LONDON: 52, QUEEN VICTORIA STREET, E.C.

IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWITH, SUPPLIES MACHINES under the above Company's Patents for DRESSING all METALLIC ORES. Dressing-floors having these Machines possess the following advantages:—

1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.

2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED BY DRESSING-FLOORS IS REQUIRED.

3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.

4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines Darlington, Colberry, Nanthead, and Bollyhope; the Stonecroft and Greyside Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esgairmwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines, Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Brateberg Copper Mines, Norway, and Mines in Italy, Germany, United States of America, and Australia, from all of whom certificates of the complete efficiency of the system can be had.

WASTE HEAPS, consisting of refuse chats and skimpings of a former washing, containing a mixture of lead, blende, and sulphur, DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly profit on our Nanthead waste heaps amounted last year to £600, besides the machinery being occupied for some months in dressing ore-stuff from the mines. Of course, if it had been wholly engaged in dressing wastes our returns would have been greater; but it is giving us every satisfaction, and bringing the waste heaps into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines, Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much pleasure in stating that a full and superior set of your Ore Dressing Machinery has been at work at these mines for fully a month, and each day as the moving parts become smoother, and those in charge understand the working of the machinery better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply, and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines, says—"Your machinery saves fully one-half on old wages, and vastly more on the wages we have now to pay. Over and above the saving in cost is the saving in ore, which is a.t much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close the mechanical mixture, in such a way as no other machines can do."

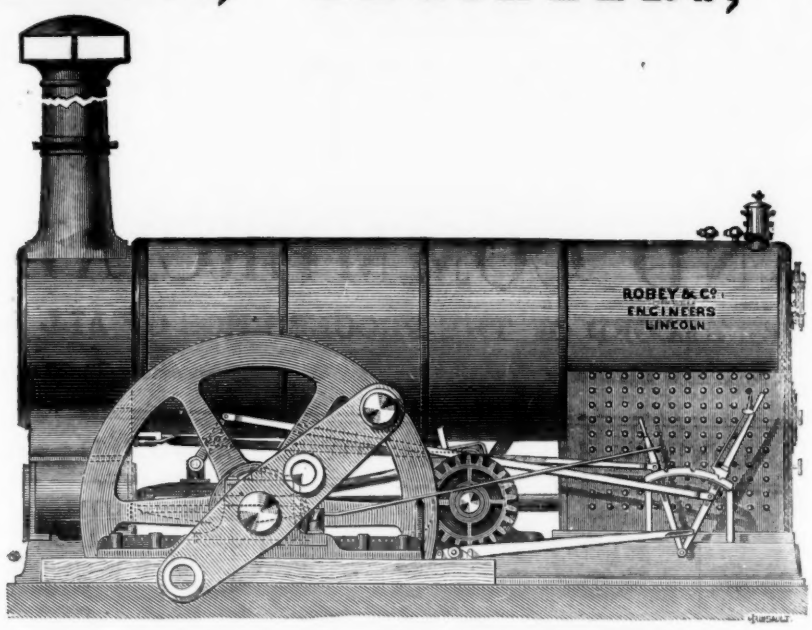
Mr. C. DODSWORTH says—"It is the very best for the purpose and will do for any kind of metallic ores—the very thing so long needed for dressing-floors."

Drawings, specifications, and estimates will be forwarded on application to—

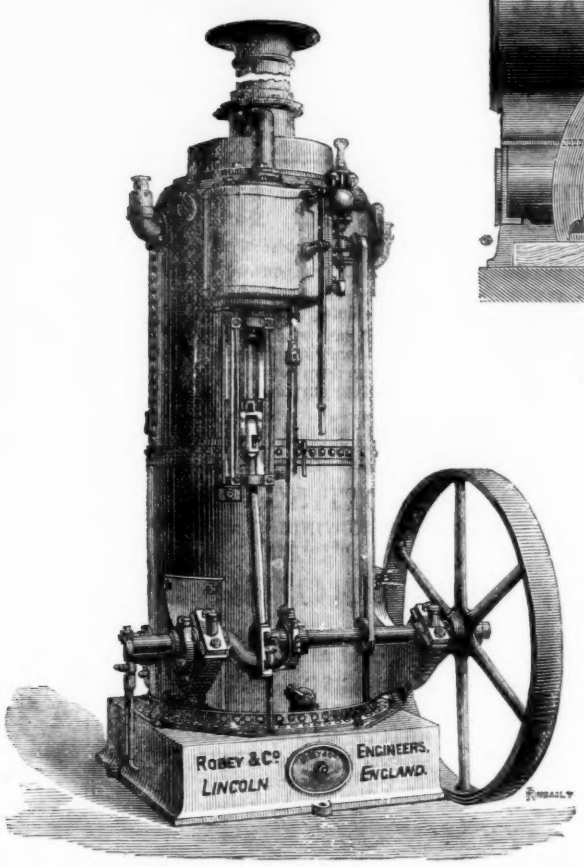
GEORGE GREEN, M.E., ABERYSTWITH SOUTH WALES.

ROBEY & CO., ENGINEERS, LINCOLN,

No Expensive Buildings, or High Chimney required.



Engines up to 200 effective horse-power always in progress.



SOLE MANUFACTURERS OF

The Patent Improved Robey Mining Engine.

Some of the advantages of this Engine are—

SMALL FIRST COST; SAVING OF TIME AND EXPENSE IN FIXING; EASE, SAFETY, AND ECONOMY IN WORKING; GREAT SAVING IN FUEL.

LIKEWISE,

SOLE MANUFACTURERS OF

Improved Vertical Steam Engines and Patent Boilers combined.

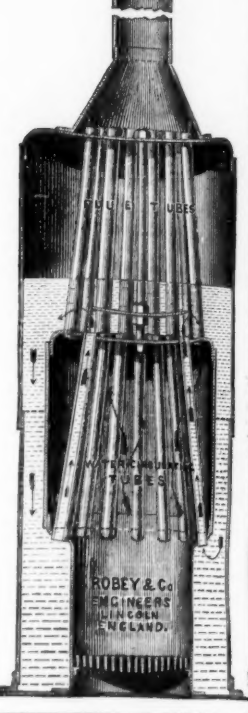
The Illustrations show one of Robey and Co.'s Improved Vertical Engines. All these Engines are supplied with R. and Co.'s New Patent Boiler, as per section illustrated, which has, among others, the following advantages over all Vertical Boilers yet introduced:—

PERFECT CIRCULATION OF THE WATER; SEPARATION OF THE SEDIMENT; GREAT DURABILITY; GREAT ECONOMY IN FUEL.

For photographs, prices, and full particulars, apply to the

SOLE MANUFACTURERS,

ROBEY AND CO., LINCOLN, ENGLAND.



PATENT

"INGERSOLL ROCK DRILL,"

LE GROS, MAYNE, LEAVER, & CO.,

60, Queen Victoria Street, London, E.C.

5, PARK PLACE, NEW YORK, U.S.A.

We claim 40 per cent. greater effective drilling power, and offer to compete with any machine of its class.

The following extracts from the reports of Judges in awarding Medals:—

"2. Its simple construction ensures durability, &c.

"4.—The steam or air cushions at each end of cylinder effectually protect from injury

"5. Its having an automatic feed, giving it a steady motion, &c.

"6. Its greater steadiness and absence of jar and vibration experienced in other drills, which is very destructive to their working parts, &c.

"7. Its greater power is some FORTY PER CENT. in favour of the Ingersoll."

Medals awarded for several years in succession "For the reason that we adjudge it so important in its use and complete in its construction as to supplant every article previously used for accomplishing the same purpose."

Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues, Price Lists, Testimonials, &c., as above.

JOHN AND EDWIN WRIGHT,

PATENTEES.

(ESTABLISHED 1770.)

MANUFACTURERS OF EVERY DESCRIPTION OF IMPROVED

PATENT FLAT AND ROUND WIRE ROPE

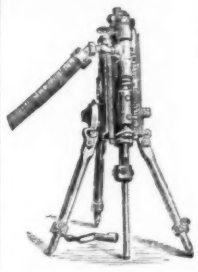
from the very best quality of charcoal iron and steel wire.

PATENT FLAT AND ROUND HEMP ROPES,

SHIPS' RIGGING, SIGNAL AND FENCING STRAND, LIGHTNING CONDUCTORS, STEAM PLOUGH ROPES (made from Webster and Horsfalls patent steel wire), HEMP, FLAX, ENGINE YARN, COTTON WASTE, TARPAULING, OIL SHEETS, BRATTICE CLOTHS, &c.

UNIVERSE WORKS, MILLWALL, POPLAR, LONDON.
UNIVERSE WORKS, GARRISON STREET, BIRMINGHAM.
CITY OFFICE, No. 5, LEADENHALL STREET, LONDON, E.

THE "CHAMPION" ROCK BORER



STANDS UNRIVALLED

For Tunnels, Mines, Quarries, Harbour Works, Cutting Blocks of Granite, &c.

The working parts are made of the toughest steel and phosphor-bronze—steel castings are also used—so as to combine strength with light weight.

AIR-COMPRESSING MACHINERY

Of the simplest and best construction.

Combined Water-pressure Engines and Air-compressors,

Giving most excellent results.

ULLATHORNE AND CO., Mechanical and Consulting Engineers, 63, QUEEN VICTORIA STREET, LONDON, E.C.

THE "CRANSTON" ROCK DRILL

SUITABLE FOR

QUARRYING, SINKING SHAFTS, SUBMARINE BLASTING, TUNNELLING, DRIVING ADITS,

Is the MOST SIMPLE and ECONOMICAL DRILL now in use.

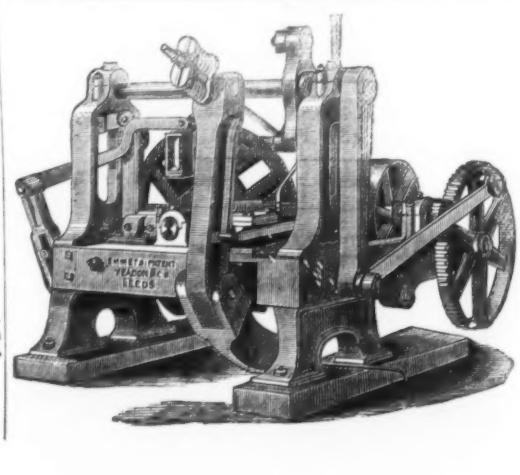
BOILERS; AIR COMPRESSORS, worked by Hydraulic or Steam-power; STEEL for MINING DRILLS; PUMPING, and all other MINING MACHINERY supplied.

For Prices, Estimates, and other Particulars, apply to—

J. G. CRANSTON, 22, GREY STREET,

NEWCASTLE-ON-TYNE.

Mr. TAIT, Manager, East Hetton Quarry Company's Works, Coxhoe, Durham, writing on May 12, 1876, says—"I have pleasure in testifying to the value of your Rock Drills. The two you supplied us with about six months ago are giving us entire satisfaction. The cost of drilling by machine is less THAN ONE-FOURTH THAT OF DRILLING BY HAND. By the use of the Drills we have been able very greatly to increase the out-put of stone without increasing the number of men employed."



EMMET'S

A1 PATENT BRICK MACHINE

Massive; durable; cheap; takes little power, and gives PERFECT SATISFACTION.

This is the ONLY Machine which presses the Brick equally on BOTH sides, each plunger entering the mould plate ⅜ in., and turning out 12,000 SQUARE, SOLID, PRESSED Bricks per day READY AT ONCE FOR THE KILN.

SOLE MAKERS—

YEADON AND CO.,

CROWN POINT FOUNDRY, LEEDS.

Makers of EVERY DESCRIPTION of Colliery and Brick Yard Plant.

LONDON AGENTS—

HAUGHTON AND CO., No. 122, CANNON STREET, E.C.

CONTINENTAL AGENTS—

PLAMBECK AND DARKIN, 171, QUEEN VICTORIA ST., E.C.

Original Correspondence.

THE MINERAL TRAFFIC AND RAILWAY AMALGAMATIONS.

What is termed the railway world, as well as many outsiders, have recently been somewhat startled by the proposals made on the part of the Great Northern and Midland Companies to take over the Manchester, Sheffield, and Lincolnshire for their joint benefit. The result has been that the shares of the Manchester and Sheffield have advanced in the course of a few days from 76 to 84, although there is not the slightest doubt but what the scheme will meet with a vast amount of opposition from several quarters. It has been asked how it happens at this particular juncture that the two great railway companies so long opposed to each other, and fighting so hard for the coal traffic to the Metropolis and the South of England from the great Midland field, should now be found acting together, and proposing to jointly take to a great concern that hitherto has been the very reverse of remunerative, and for which, judging from the share market, a price considerably above its actual value will have to be given. The only reason than can be adduced for this sudden action on the part of the old opponents is evidently to strictly preserve the manor both are partly possessors of from the encroachment of an old antagonist. By means of the Manchester and Sheffield line the Great Northern takes the greater part of the coal from the South Yorkshire district to London and the South, whilst the Midland also has several collieries along its route from Barnsley to Sheffield, from which it takes supplies, but trifling compared with what it draws from Derbyshire. It may, however, be said that the Great Northern has had almost a monopoly of the carriage of coal from South Yorkshire to London in particular, and which has neither been a benefit to the Manchester and Sheffield nor to the colliery proprietors, who for many years past have ineffectually endeavoured to have a line to the Metropolis independent of the Great Northern. In this effort the mineral proprietors have been well seconded by the directors of the Manchester and Sheffield Company, whilst the Great Eastern is looked upon as a line capable of giving the required relief. On three or four occasions the directors of the last-named company have attempted to get into the West Riding principally on account of the mineral traffic, but were always successfully opposed by the Great Northern and Midland. And it is for the express object of still trying to keep the Great Eastern out of Yorkshire that the proposal has been made to purchase the Manchester and Sheffield. This is evident from the fact that the Great Eastern directors about a couple of months ago ordered the survey of a line from their system to a junction with the North-Eastern at Askerne, some four or five miles from Doncaster, and at Lincoln with the Manchester and Sheffield. This would be the means of coal being taken from the West Riding and delivered at the East End of London, as well as at other depôts, and also at Blackwall, at a much less cost than is charged by other lines.

As the line would be so clearly to the advantage of the public, having the consent of most of the landowners through whose property it would pass, and with gradients so remarkably easy owing to the general flatness of the country, it is believed that Parliament would not refuse to pass a Bill for its construction. It would of course have the thorough support of the North-Eastern, as it would give them an alternative route to London; whilst if the amalgamation scheme were set on one side it would also be encouraged in every possible way by the Manchester and Sheffield. The North-Eastern we may state is the largest carrier of minerals of any railway in the kingdom, or probably in the world, for last year there passed over it 11,776,083 tons of coal, whilst from Yorkshire alone it conveyed 5,426,576 tons of ironstone. Such an ally could not fail to be of the greatest benefit to the Great Eastern should it be able to pierce through the nets that are set to entangle it. The Manchester, Sheffield, and Lincolnshire would also be placed in a much better position than it has been, seeing that the Great Northern has been engaged in cultivating the mineral traffic of other districts at the expense of South Yorkshire, but even with that there has been a great falling off in the quantity of coal that has passed over that line to London, the quantity in 1866 having been 1,006,227 tons, against 889,302 tons in 1876. Indeed, so far back as 1854 the quantity of Silkstone taken from three of the principal firms in South Yorkshire was 120,000 tons, against 55,000 tons in 1876, whilst from other collieries there has been nearly a similar falling off. This serious loss has been felt and repeatedly brought under the notice of the Great Northern Company by the Manchester and Sheffield directors, as well as by the colliery proprietors of South Yorkshire, who have been the sufferers, but up to the present time there has been no redress.

It is under such peculiar circumstances that for several years past great efforts have been made by the coalowners and the Manchester and Sheffield Company to have a second line of railway to the Metropolis, but on all occasions they have been unsuccessful. The first attempt was made in 1864, when a line was promoted from a point on the Great Eastern near Peterborough to Doncaster. The cost of the line was estimated at 12,000*l.* a mile, and a strong inducement was held out by the proposal to carry coal from certain parts of the West Riding to the Metropolis at nearly 3s. per ton less than was charged by the Great Northern. The Committee of the House of Commons, however, threw out the Bill, on the ground that it would be unfair to the Great Northern, the construction of which had been very costly, to have a competitor that would cost so little running side by side with it. The coalowners of South Yorkshire worked most strenuously in favour of the Bill, as did the Manchester and Sheffield and many of the largest consumers in the Metropolis, but the interests of the public in this instance, were sacrificed, in favour of the continuance of a monopoly to a railway company, and on grounds the most singular that were, probably, ever adduced, even in a committee room of the House of Commons. After this attempt nothing more was done until 1871, when the Great Eastern, in connection with the Manchester and Sheffield, promoted a single coal line about 70 miles in length, counecting the two lines by a junction at Sutton, near Peterborough, and at Doncaster. As the gradients were only about 1 in 400, it was estimated that the cost would only be about 6000*l.* a mile, and the joint companies were prepared, in the event of the Bill being carried, to engage to carry coal to London from South Yorkshire at ¼d. per ton per mile. The joint opposition of the Great Northern and the Midland—who for the time being sunk their own fierce dispute with respect to the mineral traffic so as to put down what they looked upon as a common foe—was successful, despite the powerful efforts of the colliery owners and the strong evidence given in favour of the Bill by the leading officials of the Corporation of London and others. Another attempt was made in 1873 to get a relieving line by the Manchester and Sheffield, by a railway from Doncaster to join the Midland at Rushton in the county of Northampton, but it was successfully opposed by the Great Northern. Now we have the proposal of the Great Eastern, which would be of the greatest benefit to the colliery owners of the West Riding, and to the Manchester, Sheffield, and Lincolnshire Railway Company as well on the one hand, and on the other the proposal that is intended to checkmate it by taking the Manchester and Sheffield entirely out of the hands of the present proprietary. Were this latter proposition carried out the result would be that the Great Northern would be able to come into the South Yorkshire coal field direct between Doncaster and Sheffield and Barnsley, and on the other side Penistone, Manchester, &c. The Midland would be able to go direct from Leeds to Manchester, Liverpool, &c., *via* Barnsley. These are the only advantages that appear to us as likely to accrue were the proposed amalgamation to be carried out. But in all probability it would have the effect of barring the passage, at least for a time, of the Great Eastern or any other line coming into Yorkshire with a view to sharing in the coal traffic to London and the South.

The amalgamation, cannot, so far as we can see, tend to improve the prospects of those colliery owners in the West Riding who have to rely solely on the Great Northern Railway for having some portion of the produce of their mines conveyed at a reasonable rate to the Metropolis. But the two companies, having the entire control of the coal field will be able to make such conditions as to the general traffic as may suit their convenience, so that their customers will be in a more dependent position than they have been before, whilst they will have no chance of being benefited as they have hitherto been by a battle between the Great Northern and Midland Companies for the coal traffic, which at one time led to the rates from South Yorkshire to London being 3s. per ton less than they now are. Both those companies, however, now go through the extensive Derbyshire coal field, which, being about 30 miles nearer to the Metropolis than that of several of the leading collieries in the West Riding, is sure to be much better looked after, seeing that the shorter distance, as a rule, will be the best paying. The amalgamation, or absorption, of the Manchester and Sheffield, should it be effected, will look very much like more firmly binding the existing monopoly, which has proved so prejudicial to most of the colliery owners of about the largest undeveloped coal field in England—which includes the Barnsley, Rotherham, and Sheffield districts. But whether the Manchester and Sheffield passes into the possession of the Midland and Great Northern or not, it is evident that the present position of the colliery owners of South Yorkshire with respect to the coal traffic of London is such that they will always be ready to support any new line of railway that will relieve them from being entirely dependent on the Great Northern. A new line must ultimately be obtained, for monopolies are not likely to be tolerated, more especially in such an important article as fuel, even for the benefit of so powerful a company as the Great Northern. Cheap coal is a necessity which London consumers can appreciate, and we believe they will do all they can to obtain it.

MINING IN THE EAST—No. XXI.

CONTACT DEPOSITS OF THE BANAT.

Moravicsa Iron Mines.—This group of iron deposits, mined to supply the Rechitza Steelworks with ores of iron, are in their mode of occurrence most singular, and the method pursued in extracting the hematites from the heterogenous mass of syenite, limerock, and gneiss very interesting. The iron mines of Moravicsa and Dognacska were known to the Romans, and partially worked, and it is probable that the ores were transported to Zidovin, and there reduced. The active working of the mines appears to have commenced about 1700, and the ores were drawn from the Moravicsa deposits to supply the blast furnace erected in that year at Deutsch-Bogsan, supplemented by the large quantities of bohnerz obtained from the Ferendia and Wartope mountains in the funnel-shaped hollows of the crystalline limerock. The Bogsan furnace continued in vigorous operation until 1770, at which date the Rechitza Ironworks were sufficiently advanced to commence smelting. The first casting made consisted of 100 tons of cannon balls for the King of Naples. From 1700 the mines of Paulus, Franciscus, and Theresia were in continuous operation, and to ensure the steady working of them in 1760 a colony was built to accommodate those of the miners who preferred regular employment to a peripatetic livelihood. This colony was, on account of the immense hills of ironstone exposed around it, called Eisenstein; it lies in a deep winding ravine, 1000 ft. above the level of the sea.

Although there need be no hesitation in affirming that the vast masses, or rather hills, of garnet rock and grenatiferous gangues have originated under conditions precisely similar to those which have produced the contact rocks of the Dognacska groups, yet the whole mass is at surface completely encompassed by crystalline schists, and was formerly considered to rest on them. The occurrence of such an extent of gangues without the presence of the eruptic rock usually accompanying them was so opposed to the ideas previously entertained of the origin of these rocks, that considerable satisfaction was expressed by the mining engineers when the gradual development of the deposits by continual explorations demonstrated the existence of the syenite everywhere in depth, and revealed the perfect analogy which prevailed between the three groups.

The continuity of the long and narrow band of limestone is interrupted by the Moravicsa ferruginous deposits, and only a few scattered knolls bear witness to its former extension, and to the sustained energy of that metamorphic action which has transformed it into garnet rock. Notwithstanding that the portions of limerock remaining are comparatively so small, it is around them, as around the larger lentiles, that the deposits are grouped; this complicated mass of grenatiferous gangues consists essentially of garnet rock, enclosing fragments of limerock and schists, with intercalated lentiles of magnetic and hematite iron, amongst which have been thrust numerous veins and pipes of syenite. As usual, the richest portions of the ores were found deposited next the limerock, where it was often found nearly pure; when slightly removed the ores were rendered somewhat impure by the gangue, until at a certain distance the ores became so depreciated in value by the admixture of gangue as to render their extraction under existing conditions unprofitable.

The mines principally worked are Paulus, Ignatius, Franciscus, and Theresia. As usual, the deposits are largest and the ores richest near the surface, becoming more mixed with gangue as depth is attained, or changing into sulphide. The minerals raised are magnetites and hematites, the former in largest quantity. Small pipes of very pure pyrolusite are sometimes found, and much of the ores contain a small percentage of manganese. Immediately to the east of Paulus, where the band of limestone resumes its normal dimensions, large surface cavities in the saccharoid limerock have been filled with portions of the debris proceeding from the denudation of some pre-existing iron deposits. These diluvial depo-its contain immense quantities of boulders of very pure iron oxides, some of which attain a weight of 40 tons; they are sometimes 60 ft. deep, and are found only in the highly crystalline limerock, ceasing where, further north, the usual grey compact limestone reappears.

Paulus.—This, the largest and most productive mine, is situated at the northern extremity of the mass of garnet rock, around the fragments of broken limerock, where the band of limestone recommences. It produces principally magnetite. At surface it had an area of about 1½ acre, but at the level now worked has only a third of that size.

Franciscus.—This deposit is precisely similar to that of Paulus. Much crystalline garnet is found here of a pale yellow hue.

Theresia.—Here two masses of hematite embrace a small fragment of limerock, resting on syenite to the north, and on garnet rock to the south.

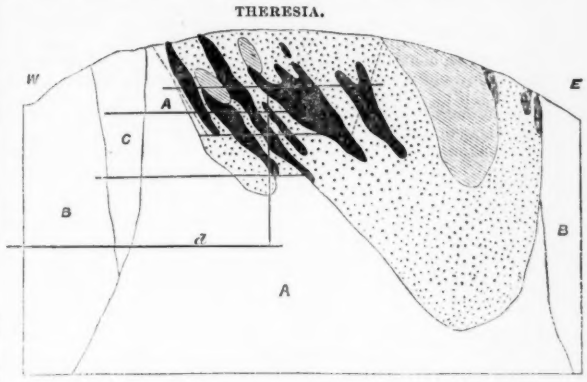
Sophia, Eleonora, and Ignatius are smaller deposits producing similar minerals.

The ores supplied to the blast furnaces are chiefly those of hematite, it having been found that much of the magnetite, though very pure, was with some difficulty reduced. The average value of the ores was over 50 per cent., the best magnetite contained 70 per cent., red hematite 58 per cent., and brown hematite 45 per cent. These ferruginous deposits occupy the summits of a series of elevations, the limerock and iron having resisted the action of the atmosphere, whilst the more easily decomposable gangue has been denuded by the Moravicsa river, whose windings have eroded deep ravine-like valleys of separation. The ruddy hues of these peaks, mingled with the glittering sparkles of the crystalline limerock, pleasantly relieve the verdant hues of the mountain slopes. On the narrow flats of this valley, immediately under the deposits, has been built the colony of Eisenstein, whose cottages, scattered irregularly about the mines, allow the workmen to reach the scene of their labours without fatigue. Lofty hills of syenite, sheltered by magnificent forests, with innumerable valleys and ravines ramifying to their summits, surround on every side this centre of mining industry.

A visit to the interior of the mines so romantically situated is full of interest. Attention is so frequently excited that no fatigue is experienced in wandering over the rugged and pathless slopes of debris. Occasionally a line of tramway or an incline is passed, whose cars continually flitting up and down with their burdens of the most useful metal give evidence of the activity which reigns within. After traversing immense banks of rubbish, sweeping in long curves to the stream below, the main tramway leading to the interior is reached. Passing over the line, some dark tunnels in limerock, which connect the various open-casts, have to be stumbled through, until finally the principal mine is entered. Wonderful is the extent of the profound excavation which rises stage over stage to the apparently far distant surface. The scene is enlivened by the miners who, working on the shelving slopes, displace on every side masses of ironstone whose fragments crashing down the funnel-shaped sides vanish into the yawning opening at the bottom, and fall with a rumbling rattle down the shaft. The sharp incessant ring of the miner's hammer and the crash of the descending rock, mingled with the shouts of the workmen and the frequent report of blasting, are redoubled by the surrounding echoes, and confuse the ear unaccustomed to the noise of mining operations.

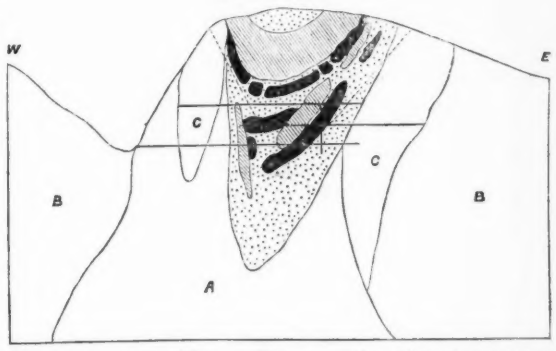
To show the general nature of the arrangement prevailing in these deposits, sections of two of the most important have been prepared, those of Franciscus and Theresia, at a scale of 400 ft. to an inch.

THERESIA.



Limerock, diagonal lines. Gangart, dotted. Deposits, black.
A. Syenite. B, Crystalline schists.
C, Gneiss. *d*. Kaiser Ferdinand Erbstollen.
Open cuts shown by dotted lines.

FRANCISCUS.



Working of the Mines.—The manner in which the mines are exploited, in order to obtain a continual supply of iron oxides at a rate as economical as possible, merits a few words of description. To facilitate the removal of the ores, the deposits are usually worked as quarries, in stopes or stages. In commencing, the surface debris is first removed, and then as much of the ore as can be extracted quarrywise; when the excavation reaches a depth that quarrying becomes too expensive a level is driven from the side of the hill some fathoms deeper, and connected with the lowest point of the "open cut" by a shaft. By means of shoots at the bottom of this pass the ores are filled into the wagons, trammed through the tunnels, and tipped down the sides of the hill into the sub-depôts; this is continued until the funnel-shaped opening reaches the tramway; when it has been so enlarged that a small even space is obtained, the shaft is prolonged and communicated with a still deeper level previously driven. In this way several stages are at length formed, and the work goes forward very rapidly on all sides, until immense oval quarries, some of which are more than 100 fms. long and 30 fms. deep, have been excavated. The deep cavities of Paulus and Franciscus, which are separated by only a lentile of limerock, now worked by the same system of tramways, are the most remarkable. The summit of the hill has been wholly taken away, leaving only some strips of limerock and gangart, so that the former height of the deposit can no longer be precisely ascertained, nor can the hollows represent more than the moiety removed during the working of a century. Under the lowest floor of Paulus the working has progressed as to form a deep tunnel, at the bottom of which the shaft receives the ores, and drops them 50 fms. to the Kaiser Ferdinand tunnel (700 yards long), by means of which the various oxides are trammed to the chief depôts at the Moravicsa Railway Station. As no ores of less than 50 per cent. can be accepted at the smelting works, a heavy proportion of the total mass removed, amounting to five-sixths, has to be thrown down the sides of the hills, which have thus assumed the appearance of colossal burrows. At present it is not necessary to be very particular in saving the stones of good iron ore intermingled with the deads, but when at some distant date the deposits may become exhausted, there will still remain these burrows, from which scores of thousands of tons can be cheaply separated by hand picking and washing.

The Bogschan and Moravicsa Railway reaches only the Paulus group of mines. The ores obtained from Theresia and neighbouring mines are forwarded by mountain inclines worked by brakes, here called Bremsberg, to the road at the bottom of the valley, and then carted down to the station. Such tramways are very cheaply and rapidly constructed, and consist of a single narrow line of rails. An ingenious method is used to pass the cars; at the middle portion of the incline a sufficient length of line, some few inches wider, is laid, which, starting from the level of the rails, and gradually acquiring elevation so as to clear the ascending wagon, again sinks to the level of the line. The axles of one wagon are fitted with double pairs of wheels, consequently when the broader gauge is reached the outside wheels run on it, and pass the descending over the empty return wagon; by avoiding in this manner a double line, little more than half the constructive cost is requisite.

From the description of the mode of extraction above given it will have been understood that the ores may be broken economically by blasting, the debris falling with little or no labour into the funnel-shaped shafts. But the immense quantities thrown down amount to a heavy aggregate of expense, and any method by which even 6d. per ton could be saved would reduce considerably the yearly expenditure. In 1865 a beneficial change was effected by the manager, whose active mind could ill brook the slow progress made by boring and blasting. Determined to try the effect of blasting *en masse*, he caused a level to be driven into a hard and compact precipitous cliff, in a turn of which were disposed 3000 lbs. of black powder. To ensure a complete explosive effect, the gallery was closed at intervals by five dams of heavy wood, between which soft rock was packed. The charge was fired by a Bickford's caoutchone safety-fuse, and the result was perfectly successful, 3000 tons having been thrown out, besides shattering an immense mass of rock that could be cheaply quarried. The total expense of obtaining the above-mentioned quantity was 214*l.*, and it was ascertained that the cost was 1s. 6d. per ton less than the usual sum.

The distance of the mines—30 miles—from the smelting works and the low value of their produce demand the strictest economy of extraction and transit, and to ensure the former the ores are mined on a rigid system of payment by weight. The total cost per ton of the ores delivered at the Rechitsa Smelting Works is as follows:—Raising and placing at Moravicsa, 5s. 8d.; administrative expenses, 11d.; freight to smelting works, 3s. 10d. = 10s. 5d. During 1876 the amount of ores raised from the Moravicsa iron mines was 35,000 tons, but the whole of this quantity was not delivered at Reschitsa, as a large reserve is allowed to accumulate at the mines,

which stock at present amounts to 200,000 tons. Owing to the great depression in the iron and steel trade, the production during 1877 will be reduced to 15,000 tons. The production from 1855 to 1866, inclusive, is said to have been over 700,000 tons, or nearly equal to 60,000 tons per annum. During the four years ending 1876 there were raised 131,150 tons.

TILVA ZAPULUL.—On the road from Dognacska to Reschitsa, at a place called the Goatcopse, is a very interesting and peculiar deposit of magnetic iron. It is, perhaps, the transported remains of a deposit of ironstone and gangue, similar to those of Eisenstein, the result of complete denudation, its former position not having up to the present time been recognised. It is situated on the mountain plain separating the valleys of the Moravicsa and Rechitsa, and comprises four distinct beds under the surface mould. First a bed of marly clay, containing decomposing fragments of neighbouring rocks, followed by a bed enclosing variously sized boulders of magnetic iron, after which succeed a bed of similar loam, and a second bed with magnetic ironstone, which rests on the highly inclined basset edges of a conglomerate of carboniferous date. Large quartz blocks are found scattered through the whole of these beds, and the nodules of magnetite do not appear to have travelled far, as they show few signs of wear.

Owing to the loss and destruction of statistical documents during the revolutionary troubles, it has been found impossible to obtain the quantities of metals produced before the States Railway Company purchased the concessions from the Hungarian Government. This is much to be regretted, as the returns of the mines during their prosperity cannot be tabulated. The following figures do not include the iron oxides produced by the Moravicsa mines, as these have been mentioned above. The weight of the precious metals is given in pounds, and that of the base metals in tons.

TABLE SHOWING PRODUCTION OF THE DOGNACSKA DISTRICT.

	Gold.	Silver.	Copper.	Lead.	Litharge.	Zinc.	Pig-iron.	Iron ores.
1833 to 1842	... 8·90	... 9806	... 146	... 350	... —	... 549	... —	... —
1855 to 1873	... 26 80	... 9615	... 282	... 93	... 8789	... —	... 41,502	... 165,746
1873	... —	... 456	... 18	... 1	... 28	... —	... 3,322	... 32,421
1874	... —	... 448	... 6	... 3	... 25	... —	... 3,850	... 14,063
1875	... —	... 686	... 15	... 5	... 46	... —	... 4,143	... 14,139
1876	... —	... 356	... 14	... 18	... 30	... —	... 3,945	... 16,089

Both the lead and copper are argentiferous, the latter holding 98 per cent of metal. The silver is refined from the lead in the Dognacska Reduction Works, whilst the copper is sold to Szaska, where it is desilverised, and the silver produced returned to Dognacska.

Bersaska, Sept. 11. EMPRESSARIO.

THE EUREKA AND RICHMOND DECISION.

SIR,—We have now before us the full report of the decision of the Judges in this important American dispute. Judging from the expressions uttered by many of the speakers at recent meetings in this country, a feeling of dissatisfaction with this and other decisions of American Courts on mining matters seems to be general. It may not be amiss, therefore, if we give a summary of this case, and briefly review the grounds on which the decision was given for the plaintiff.

The plaintiff was the Eureka Consolidated Mining Company, a company that had been incorporated under the mining laws of California. The defendant was the Richmond Consolidated Mining Company, a company created under the laws of Nevada. The plaintiff brought an action of ejectment against the defendant, who, it was alleged, was trespassing on ground belonging to the plaintiff. The defendant denied the trespass, and claimed the ground both as containing a continuation of the lode belonging to him, and also on the plea of priority of claim and settlement. The suit was originally begun in the State of Nevada, but on the application of the plaintiff, who held his patent under the laws of California, the cause was finally tried recently in the town of San Francisco, before Judges Field, Sawyer, and Hillyer, all judges of the greatest eminence in the United States.

The ground in question was of great value, amounting by estimation to several hundred thousand dollars. The case was prepared with the greatest care on both sides, and the chief mining and scientific experts of America were called in as witnesses. The counsel, also, on either side were men of eminent ability, and the judges in their decision say that "whatever could inform, instruct, or enlighten the Court was presented by the parties interested." By the aid of glass models the structure of the ground and the position of the ore chambers were made perfectly transparent. The ground in question was situated on Ruby Hill, near the town of Nevada. The geological structure consisted first and lowest of a deposit of quartzite. This was succeeded by a series of limestone beds, reaching a thickness of 500 ft., which contained veins, strings, and pockets of ore. This limestone was capped by shales. The whole of the strata were highly inclined. One of the grounds on which the plaintiff asked to eject the defendant was that the latter was working on his lode. The old laws of the United States granted certain lengths along a lode which had been discovered by him to an original adventurer. The defendant denied this, and contended that his lode ran diagonally to that worked by the plaintiff. "But," rejoined the latter, "it is in my ore-bearing ground; it is on the metal-bearing limestone, and, therefore, it is on my lode." The first point to be decided by the Court was, therefore, whether this belt of limestone was a lode, as contended by the plaintiff, or a series of stratified beds containing various lodes and courses of ore as held by the defendant. The Acts of Congress do not define what a lode really is, and the choice of the Court lay between accepting the scientific and natural—and, we will add, mining—view of a lode as that of a crack, fissure, or dislocation in the rocks of the earth filled with mineral matter; or the meaning of the word, which the plaintiff contended old miners in America attached to it, as a zone or belt of mineral ground.

The Court, relying mainly on the evidence of Dr. Raymond, a Government mining authority, adopted the latter view, and concluded that the term, as used by the Acts of Congress, means any "zone or belt of mineralised rock lying within boundaries separating it from the neighbouring rock." Now, with all deference to the Court, we think this was a great mistake. It was clearly against the weight of evidence. There is no controverting the evidence of Mr. King, a witness for the defendant, that limestone was not a lode. It was simply limestone resting on quartzite below, and covered with shale above. Distinguishing such a deposit from a lode like the Comstock, Mr. King truly added, "the Ruby Hill deposit is a series of sedimentary beds laid down in the ocean and turned up; the Comstock is a fissure extending between two rocks."

The judges stuck to the idea that a mineral-bearing rock, however thick, was a lode. The facts were against them, but so much the worse for the fact. Let us for a moment apply their decision to a parallel case in this country. Take the belt of limestone extending from Minera to Holywell, in North Wales. It is highly mineralised. It is well defined from the shales below and the sandstones above. Its thickness is not much greater than that of the Ruby Hill limestone. It has its pocket, flats, segregations, veins, and courses of ore, which do not enter the adjoining strata. There is not an argument used by the judges in reference to the Ruby Hill limestone that does not apply with equal force to the limestone of Flintshire. Yet, according to the American decision, this zone of ore ground, with its hundred mines and its unnumbered veins, is a lode. The same would be true of the like formation containing the lead formation of the northern counties. It would be equally true of any other ore-bearing strata lying between other but barren strata above or below. But what miner in Britain, even if he had never heard the scientific definition of a lode, would call the limestone of Flintshire or that of Northumberland and Durham, or the clay-slate lying between hard rock in Wales or Cornwall by that name? Such an absurdity, untrue alike to mining experience and natural phenomena, has been left to an American law court.

The next point in the case turned upon the priority of the claims set up by the respective parties. It was admitted that the defendant's claims were the earliest, and that according to certain mining laws he was entitled to follow all lodes, spurs, and veins connected with his grant. This right it was urged was confirmed by the Act of 1866, which gives the first locator "the rights to follow such vein or lead with its dips, angles, and variations to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition." This law was clearly in the defendant's favour, but American laws are elastic enough to embrace a whole formation in a lode, and contractile enough to limit this unlimited following of a lode in depth as judges may decide. The law must be limited, say the judges, otherwise it would follow minerals under B property. Just so, that is the very right the law does give to A as the first discoverer and locator, and B bought the land subject to the condition. The judges were there to administer, not to alter, the law, and on this second ground it seems to us the verdict should have gone for the defendant. In the third point in the decision—as far as the report indicates the plaintiff certainly had the best of the argument—an agreement is said to have been entered into by both parties in which the defendant conveyed all land with mining rights south-east of a designated line to the plaintiff. The ground in dispute was south-east of that line, and was, therefore, ground which for certain considerations the defendant had formally surrendered. Unless the defendant has an answer to this plea, which does not appear in the report, he was clearly in the wrong, and the decision is fairly against him. On the other two pleas he seems as fairly entitled to a verdict in his favour. D.

Oct. 30.

RICHMOND MINING COMPANY.

SIR,—Your correspondent, "Investor," appears to consider that the Richmond Mining Company directors are scarcely treating their constituents well in omitting to take them into their confidence at present. Your correspondent apparently forgets that a commission of three shareholders deeply interested in the success of the mine, and of first-class qualifications for the duty they are charged with, are at present at the mine for the special purpose of reporting on its condition and prospects; and, as their report will doubtless be shortly forthcoming, we shareholders shall then know for certain what to hope and fear from our hitherto most vexatious and tantalising of investments—by some pronounced to be not worth 10s. per share, and by others considered to be cheap at 10*l*. It is, however, much to be desired that the directors would issue a sketch-plan and section of the mine, so that the proprietors might be able to follow intelligently the points at issue between the Eureka Company and themselves (on which possibly we may be yet called collectively to express an opinion), as well as to understand the position of the various workings referred to in the manager's reports. SCOTUS.

Oct. 30.

THE RICHMOND MINE.

SIR,—Can any reader inform us what is the probable amount of profit upon the $410,000 for the seven runs ending last week? From private sources I learn that the amount is exceedingly great. A figure has been mentioned which appears to me placed too high—50 per cent. Anyone in authority would confer a great kindness upon the shareholders by answering this question. If this sum is anything like correct there can be no difficulty in accounting for the great rise in the shares. Any insinuations thrown out in a circular I received this morning, touching the financial position of the mine, may, in the face of such weekly returns sent over lately, as well never be written. Such statements as "500,000*l*. claim" attaching the mine, &c., will scarcely receive notice.

RICHMOND SHAREHOLDER.

THE JAVALI MINE.

SIR,—After great depression the prospects of this mine are again brightening. The quartz which partly through the month of August continued at low value gradually improved, and a profit of 25 per cent. on the month's working was realised. The deputy manager reported further improvement when the mail left; still greater results also from the tailing-mill will probably appear in next account. B.

ROCK-BORING MACHINERY.

SIR,—It is gratifying to find that miners are at last showing some disposition to give rock-boring machinery the attention it deserves, for there can be no question that by its judicious introduction into our home mines many of them might again be brought into profit, and the favourable feeling towards that class of enterprise would be revived. I have noticed frequent references in the *Mining Journal* to rock-drills of various forms, from the simple valveless drill of Darlington to the complicated, but still admirably working, Dubois François; and it appears to me that as a mining tool the great necessity for success is that a very small quantity of the motor fluid, which I will assume to be compressed air, should be used, and that a comparatively low pressure should suffice. It appears to me certain that it is essential for the success of all rock-drills in Cornish mining that the compressor, which should, of course, be compact in form, should be located underground, and at as short a distance as possible from the machines. I feel convinced that the cost of making a chamber of ample size and taking down the fuel would be vastly less than the cost of keeping the pipes in order from surface, and allowing for the loss of pressure there would be the additional advantage of increased ventilation. And with regard to the machine itself, my opinion is decidedly in favour of that class in which the tool stock is reciprocated by the direct action of steam or compressed air. In machines of this kind the effective work is done by the stroke of the piston in one direction, and the return stroke of the piston is only required to withdraw the working parts into suitable position to enable them to repeat the working blow.

Now, in the class of machine just mentioned, Messrs. Goubert and Pratt, of New York, have recently introduced some improvements which certainly appear to be worthy of attention. They effect the reciprocation of the tool stock by connecting it with a piston having a variable area upon its opposite sides, the side having the smaller area being that upon which live steam acts for the purpose of delivering the working blow, while the side of the piston having the larger area is acted upon to withdraw the tool stock and tool from its work, such withdrawal being effected by the operation of a suitable valve, valve passages, and ports, whereby the steam which has effected the working stroke is conducted or whipped around to the opposite side of the piston, where it expands and effects the return stroke of the piston by reason of the greater area which that side of the piston presents. The steam which has thus effected both strokes of the piston is discharged from the cylinder by the next working stroke, hence they exhaust at comparatively low pressure, and thus economise in the use of motive power. They also employ an automatic friction feed, the operation of which is governed by the extent of the advance of the tool at each working blow, the feed mechanism being set preparatory to performing its functions by the last part of the motion of the tool-stock. As rock drills may penetrate more or less at different blows, according to the varying hardness of the rock in which they are worked, the forward movement of the piston, and consequently the movement of the valve, is determined by the point at which the drill brings up on the rock. It is necessary to provide valve-gear, which is capable of effective operation under the circumstance of a varying stroke of the piston. In this machine the working stroke of the drill is effected by live steam acting in the trunk end of the cylinder, and the return stroke is effected by the same steam acting expansively through the open ports connecting the opposite ends of the cylinder upon the greater area of the face of the piston.

Although it may happen that the valve will be thrown too far by the downward stooke of the piston owing to the excessive penetration of the drill, and the steam port will thus be opened, they are enabled to close that part as soon as the return stroke commences, and thus prevent the waste of steam on the return stroke of the piston. While live steam is being admitted into the trunk end of the cylinder the exhaust port is open, and they thus exhaust at low pressure because they have only introduced live steam enough to fill the annular space, and that quantity of steam, by passing around into the space in front of the piston has expanded during the back stroke of the piston. In order to facilitate the starting of the piston in case the slide-valve is not in proper position when steam is first let on, they arrange in connection with the inlet valve two small passages on each side of the principal steam port; by turning the valve plug in either direction live steam may be admitted directly into the ends of the cylinder through the passages mentioned, and the piston being thus started the valve plug is turned in the required direction.

The outer end of the trunk piston is secured to a cross-head, the projecting portion of which constitutes the nut which engages the male thread on the upper portion of the tool stock or drill carrier bar. The lower end of the nut is secured to the tube, which affords a bearing for the carrier bar. The tube reciprocates with the nut, and is supported by the bearing on the side of the cylinder. The tappet projects laterally from the nut, and is perforated to receive the valve stem. On the side opposite the tappet another arm projects laterally from the cross-head, and is perforated to receive the rock shaft. The arm is formed into two spiral wedges, and which are respectively on opposite sides of the rock shaft, and are inclined in opposite directions. The wedges reciprocate with the drill bar, and act simultaneously upon the shell cam, which is affixed to the rock shaft. This cam is composed of two pieces, the ends of which respectively form tight fitting collars, which are affixed to the rock shaft by the pin or set screws. Between the collars the cam forms a tubular shell surrounding the rock shaft, and having upon its opposite sides slots in which the reciprocating wedges travel. The shell cam is made in two pieces to promote convenience in putting the machine together. The first cost of the machines would be no greater than any other, and I really think it has much to recommend it.—*Hayle, Oct.* 30. W. H.

ROCK-DRILLING ENGINES.

SIR,—I am a practical constructor of rock-drilling engines, and have them working in some of the hardest as well as the softest known rocks in this country, and I warrant every machine sold to work in all kinds of rocks, hard or soft; for whatever the nature of the rock the machine accommodates itself to it, no matter how seamy or jointy the rock may be. I have constructed a drill that will make a straight round hole and not stick in the seams, whereas with the common drills when they get into the seams or joints they often meet, and the hole must be abandoned. I have never had a machine condemned when once started, but on the contrary have some good testimonials of its merits in strength and simplicity of working parts, and I challenge anyone to produce a mine or quarry that my machine will not do three times more work in than is done with hand labour, and I hope Mr. Kitto will investigate the merits of my machine, and any information asked for at the office of Dunn's Patent Rock-Drill Company will have prompt attention.

Goswell-road, London, Oct. 30. W. W. DUNN.

COLLIERY EXPLOSIONS, AND THEIR PREVENTION.

SIR,—It is with great diffidence that I venture to ask permission to offer some remarks on this complicated question, for whenever these calamities happen I have observed that, while possible causes are stated, quite as many are omitted, and amongst them some of the most probable pass unnoticed. Indeed, I may say that the conclusion come to, usually in haste, is that somebody neglected his duty, or that naked lights were used when safety lamps only ought to have been used, or that some stupid fellow had opened his lamp or struck a light.

Explosions will of course occur from any of these causes, but there are other reasons besides which will explain the explosions of fire-damp. To understand the question we ought first to know some of the properties of fire-damp, especially as to when it will and when it will not explode. Now, the gas called by the unscientific name of fire-damp is three-fourths carburetted hydrogen and the remaining one-fourth other gases in variable proportions. It is, then, an uncertain compound. When fire-damp is unmixed with air or mixed with it in some such proportions as 1 to 3 of air it will not explode, but produces suffocation or drowsiness, and extinguishes flame for want of oxygen. When fire-damp is diluted with from 15 to 30 times its volume of air it causes the flame of a safety-lamp to enlarge, and to be surrounded by a blue envelope of incandescent gas; in this state it burns and flickers with a blue flame, but does not explode. When, however, the atmosphere in a mine becomes a mixture in the proportion of about 8 of air to 1 of fire-damp, then the danger is extreme, for it is explosive in the highest degree.

From the foregoing it is evident that fire-damp alone does not produce such dire calamities, but rather it is fire-damp rendered dangerously explosive by mixture with air in certain known proportions. Perfect immunity, then, from explosion requires that the explosive mixture shall never be made. But is that possible? I venture to think not, because fire-damp while passing from an unmixed to a harmlessly diluted state must in its course of change arrive at the danger point, and should it then be travelling at the rate of a five-knot breeze the danger of explosion is very great, for the gas then on fire inside any safety-lamp is liable to be blown through the wire gauze, and so fire the mine. Now let us imagine that by good luck the fire-damp in its highly explosive state is not exploded in its transit through the mine to the up-cast shaft. What will happen on its arrival at that point when a mine is ventilated by furnaces, as in the Blantyre Colliery, the scene of the late calamity? Why, an explosion of perhaps many millions of cubic feet of fire-damp, extending through perhaps miles of roadways and headings. So much for fire-damp. Let me now say a few words as to safety-lamps. It is a total fallacy to assume that safety-lamps secure immunity from explosions, for in real truth they do no more than lessen danger. When there is no danger a safety-lamp is a hindrance, when there is danger it gives only more or less safety, according to circumstances. For instance, a good safety-lamp renders explosion improbable even in the most explosive fire-damp when all is still; but motion produces danger. Thus in highly explosive fire-damp—eight of air to one of gas—a man running or even walking quickly, or a lamp dropped, or spun round or swung in carrying, might fire the mine, or suppose one mesh of the wire gauze out of the 20,000 or so meshes in a Davy lamp got accidentally enlarged from (say) 1-60th to 1-40th of an inch, all might be lost in a single second.

How to avoid an explosion of fire-damp when all is ripe for it will be understood as a critical point when it is remembered that were a miner to blow out his lamp to escape danger he would be dismissed, since his doing so might have fired the mine.

In passing I may observe that many a man loses his life not from the explosion, but by being rendered insensible and thrown on the ground, and there enhaling the choke-damp and after-damp, or miners style carbonic acid gas and the products of explosion.

There is yet another cause of explosion to which I must call attention. I allude to blasting, or shot-firing as it is called. Now, shot-firing in mines where safety-lamps are used (by no means an uncommon custom) is as great an anomaly as it would be to work with safety-lamps and naked lights side by side, besides the shot from the shot tends to loosen the surrounding strata, and so would facilitate an escape of gas. I have now mentioned several causes, besides those usually given for the explosion of fire-damp, which should, therefore, suggest what may give the greatest security where all is so insecure.

In the first place, ventilation by furnaces, which is an old-fashioned and generally obsolete system, ought to be abolished by Act of Parliament, and mechanical ventilation by fan substituted in its place; instances are recorded where fire-damp drawn by the current of ventilation to the up-cast shaft has exploded a mine. I could myself name an instance. Then, I think "shot-firing," if not absolutely abolished, ought to be resorted to only in very exceptional cases. As to safety-lamps, the most sensitives to the presence of gas, and of the very best construction, regardless of cost, ought alone to be permitted. Some of your readers will be surprised to hear that the making of safety-lamps is often the means of living to needy old men, and that the trade frequently offer their safety-lamps in quantities 52 per cent. discount. Now, as most safety-lamps can be purchased at from 3s. 6d. to 9s. 6d. each retail, it is self-evident much handicraft cannot be given to their make. As before stated, no safety-lamp gives immunity from explosions; but the best is far safer than the worst, while the cheapest are often selected simply because they are the cheapest. Having given the greatest attention to this subject for some years I venture to claim

pretensions to write with some authority, well knowing that my views are ably supported by men of great ability and practical knowledge.—*Nov.* 1. ——— J. D. SHAKESPEAR.

THE BLANTYRE EXPLOSION.

We have been requested to publish the following letter, which has been addressed by Lord Kinnaird to Mr. Macdonald, M.P.:—

SIR,—We would require to take advantage of the sympathy which has been aroused over the whole country for the sufferers by the fearful explosion in the Blantyre Mine to get the adoption of those more stringent measures for the preservation of life which we endeavoured, but failed, to carry on the passing of the Mines Regulation Bill. Amongst these was the compulsory adoption of the Fire-Damp Indicator, which, you will remember, was exhibited before members of the House of Commons with a most satisfactory result. But we could not get a clause inserted in the Bill making its use compulsory. Now, there is every reason to believe that had this indicator been in operation in the mine that sad disaster might not have occurred. It would hardly be possible to forbid the use of naked lights and blasting in all mines. Though in all mines there is a chance of meeting with blowers, or gas in a goaf, and the consequent chance of letting loose this dangerous gas, either in the working or by the fall of the roof; but were the mines fitted up with the indicator, the operation of it is so immediate that notice would be given simultaneously in all parts of the mine and at the surface, so that lights could be at once extinguished and the men be enabled to leave the mine, by which means the chances of accidents by explosions would be reduced to a minimum. Other preventive measures might be carried, taking advantage of public feeling in the country.

I observed lately that some men lost their lives at Wigan by overwinding—this is an unpardonable neglect, and the owners ought to be severely punished.

You will remember the case of the Wellington Colliery—how the owners pooh-poohed my advice to adopt the simple contrivance to prevent the possibility of such an accident again occurring, but were compelled ultimately to apply to me to point out where it could be seen in operation, as the men wisely, on my recommendation, would not go down till it was put up in the mine. Could not something of the some plan be adopted in regard to other precautions against accidents?—*Rossie Priory, Inchture, Oct.* 27. KINNAIRD.

COLLIERY ACCIDENTS, AND THEIR PREVENTION.

SIR,—A correspondent in last week's *Mining Journal*, signing himself "A Large Employer of Labour," says—"Let Mr. Macdonald, Mr. Halliday, Mr. Burt, and all these workmen's friends teach them that the only salvation for the workpeople of this country is the cheapening of production. Unless production can be rendered cheap our trade will vanish, and our workpeople must emigrate or starve." This is so complete a confirmation of the view expressed a few weeks since in the editorial columns of the Journal that there can no longer be doubt that the feeling is extending itself. For my own part I do not consider that either statement goes far enough. If it were merely a question of working cheaply in this country, or emigrating and obtaining good wages in another, the loudest ravings of employers against rise of wages would be ineffectual, as working men, even more than other classes, are quite willing to change their location whenever such change will better their condition. But the truth is that owing to the general improvidence of English workmen (not unfrequently resulting from intemperance, though sometimes from their incompetence as members of the trade to which they belong) they have no funds to enable them to emigrate, even should they feel the inclination to do so. Consequently, if we admit, as we must admit, that the cheapening of production is a necessity, the alternative is not between low wages and emigration but between low wages and starvation.

It is beyond question that the higher rate of wages has not permanently improved the position of the working man who is fully employed, as he can purchase no more luxuries nor comforts now than he could 20 years ago, the reason being that, as less work is done, workmen as a class do not receive more wages per annum and per hundred men than formerly. The fact that the hours of actual labour per week are fewer is of very questionable advantage to the man, and in the result shuts the master out of markets which he could formerly control, and thus increases the difficulty of providing employment. A return to the old rate of wages and the old hours of labour would do something to restore the lost markets and increase the general prosperity of the country. The agitators and delegates care far less for the welfare of the working man than the most unscrupulous of masters, and the reason is obvious. The interests of the masters and the men are, to some extent at least, identical; that is to say, the master knows that whilst his workmen are idle his capital is earning nothing, and the workmen know that if the master can find no market for his productions there can be no work for them. The case of the agitator and delegate is altogether different; he has no common interest with either capital or labour, with either master or man. His sole object is to promote discontent on either side; if he can create the feeling amongst the masters that a reduction of wages is necessary it is just as profitable to him as the promotion of a strike for higher wages on the part of the men. In both cases the agitator and delegate, as the friend of the workman, draws a small percentage of that workman's hard earned wages as fees for advocating his cause; and, so long as he can do this, he regards the starvation of the workman's family with supreme unconcern, and lives in luxury himself. Let any workman ask himself whether he ever saw a professional agitator for workmen's rights who ceased to draw his salary during the continuance of a strike, and he will see how intensely selfish and dishonest these delegates are; but there is an old maxim that "a knave and a fool are born every minute," and whilst sufficient of the latter class are to be found among the working population to supply the requirements of those belonging to the former class who make working men the field to feed upon, it would be unreasonable to expect that so profitable a one would be neglected.—*Oct.* 31. ——— H. D.

SAFETY IN COAL MINING.

SIR,—The disastrous accident at Blantyre collieries has brought the question of safety in coal mining prominently before the public these accidents, which are much more frequent in the North of England than happily they are here, must be attributed to a considerable extent to the method of working employed. This consists in driving narrow places or mines through the coal till the march of the property, or some other convenient distance is reached, leaving square blocks or "stoops" of coal to support the roof. These stoops are removed on the way back, and the "waste or gouf" thus created is allowed to be filled up by the collapse of the superincumbent strata. This is very much the system employed in the thicker seams of the Lancashire coal field, and is with some of these the only one practicable, so far as our present knowledge goes. This system is comparatively safe if the strata above on the removal of the coal bend down and fill up the space left in a uniform manner.; but if the strata break irregularly, and leave rents, cracks, or spaces up for a considerable height, a source of danger is created. These cracks, and the any spaces between the fallen debris, being cut off from the air on the inner side, or that next the march, should gas accumulate in them, as there is every chance of its doing, there is no escape for it except towards where the men are at work on the limits of the mine nearest the shaft. These men usually work with safety-lamps; but in a pit where gas has not been seen for months the men in the world get careless in the use of them. The gas in the crevices above described may be forced out by a subsidence of the superincumbent strata within the area of the "waste," or it may break out in the event of a change in the pressure of the atmosphere. The smallest tongue of it issuing out in this way, and coming in contact with an unprotected light, or even if sent out with considerable velocity against a safety-lamp, would fire and act like a train of gunpowder, exploding the whole gas within the waste, if the gas was not very extensive. Fire-damp before exploding with air must be mixed with a certain proportion of air, so that at first, if the area of the waste be large, a considerable portion of it might not be exploded. This would probably be disturbed by the concussion, and in the event of the air rushing in to fill up the partial vacuum caused by the first explosion, another would follow. This may account for the double and treble explosions that have taken place in some instances. Any of the above theories would account for the Blantyre explosion, and still no one would be to blame, as it would be impossible to detect the gas in the cracks, &c., because no access can be got to such, and it may never have been seen till its explosion spread death and destruction around.

After some years study of the question, I see there are great difficulties in the way of a remedy; but so as to meet these and to render these operations as safe as possible, I would suggest the following plan:—When the limit of the field is reached a range of large stoops (say, 30 to 100 yards square, according to circumstances) should be left unworked. Between these and the march, and close to the latter, a "place" or mine should be driven to be used as a permanent air-course to drain the waste. After the stoops have been begun to be removed between these large pillars and the shaft, the air circulating in this air-course should be carefully conducted to the upcast shaft by itself. The air supplying the men removing the stoops would have a tendency to percolate through the waste into this air-course, and thus keep the former free from accumulations of gas. This plan might meet with some opposition from the landlords, for fear of losing the coal in these large stoops, but in most cases they could be ultimately recovered. The plan suggested is one which has an element of safety in it entirely wanting in that now usually employed.—*Glasgow, Oct.* 27. MINING ENGINEER.

METEOROLOGY AND COLLIERY EXPLOSIONS.

The following letter has been addressed to the Birmingham Daily Post:—

SIR,—Your paper, like the most of the daily papers this week, has devoted a leading article to this subject, and as it is one of such great interest and importance to the public, and especially to the coal-mining community, I take the liberty, with your permission, of making a few further remarks upon it. In the first place, I may say that the subject is one which has the most constant and careful consideration of managers, and for some months past it has been specially under discussion at the Midland Institute of Mining Engineers. That the weather has something to do with ventilation we all admit, but its effect is only appreciably felt in shallow mines and those which are imperfectly ventilated, or such as have no systematic way of carrying on a circulation of air in the underground workings. In fact, a shallow and badly ventilated mine may be compared to a weakly constituted individual, who is always attributing his ailments to the state of the weather.

To put the matter theoretically, a fall of 1 in. in the barometer is equivalent to a reduced pressure of 70 lbs. per square foot; and a rise of the thermometer of 16° F. has theoretically the same effect on air and gases as a fall of 1 in. in the barometer; but it is found in deep mines the temperature is nearly constant all the year round. From observations spread over a series of years it appears that explosions of fire-damp are more frequent in winter (December and January) than summer, when the circumstances, according to theory, are favourable to ventilation, from the fact of the air which enters the mine being much colder, and that the atmospheric pressure in winter being on an average 70 lbs. per foot more than in summer. I should not have troubled you with this letter had you not stated in your article—what, indeed, is very similar to the views of the other papers referred to—that "in the present state of the weather colliery explosions are to be looked for." Now, Sir, colliery managers who have paid attention to this subject cannot admit this—at least, without comment. What we say is that a colliery ought to be always so ventilated that, it matters not what the state of the weather is, there shall be a good current constantly in circulation to render harmless all noxious gases.

From a practical point of view meteorology has not so much to do with explosions as has been stated, and to show that I am not singular in this view I quote the following from the *Mining Journal* of to-day:—"The present manager of the well-known Oaks Colliery, in South Yorkshire, Mr. Wilson, who has had great experience with respect to sudden outbursts of gas and their attendant destructive properties, publicly stated that the barometer, so far as mines were concerned, could well be dispensed with, for he had noticed that when they had a large quantity of gas previous to the barometer falling, they had it also previous to its rising." I may state further that a German writer, after comparing the meteorological conditions with the occurrence of 396 explosions in 17 years in his native country, said—"We dare not say whether or not the engendering of fire-damp is influenced by the natural pressure of the air." (See Gluck Auf.) The unfortunate explosion which occurred at Blantyre on the 11th was with the barometer at 29·75, whereas the previous Monday it was 29·20, and on the 25th was as low as 29·40. It is possible, as the explosion occurred on Monday morning, that there had been a fall of the roof in the air-way between the time of the men leaving work on the Saturday and resuming it again on Monday, which may have choked up the air passage. This would be sufficient to cause an accumulation of gas.

Many explosions that have come under my own observation as a mine agent have been entirely through the negligence of the colliers, and some have been traced to defective lamps. I very much question if the Davy should now be called a safety-lamp, and believe the Stephenson a far better lamp for the purpose, as it has been found frequently in the Yorkshire collieries when a sudden outburst of gas has occurred that this lamp has been immediately extinguished, when in all probability the Davey would have become red-hot. Col. Shakespeare's remarks on this question of lamps, in his letter which appears in to-day's Times, are well worthy of notice, and we may add that is is very desirable that all lamps used in fiery mines should be put to some test before being taken into any mine.

Blaxwich, Oct. 27. W. FAIRLEY, Mining Engineer.

SULPHATE OF BARYTES.

SIR,—In looking over your valuable Journal of this day (Oct. 27), I noticed Messrs. Watson Brothers' remarks on the Bantry Bay Barytes Mine. They say it is believed that this is about the only quarry that can supply any large quantity of it. I know nothing of the mine or quarry named, not having seen it; therefore, I do not doubt Messrs. Watson Brothers' statement as to the mine supplying large quantities of barytes. But, just to let the public know that we have a barytes mine in this county (Shropshire) that is capable of supplying a large quantity monthly—say, 100 tons and upwards per month—I give you an extract of a private report I had from a gentleman well known in the mining interest. After a few preliminary remarks, he says—"I congratulate you in being in possession of such a valuable undertaking. The advantages you possess are very great—such as extent of sett, width of lode, and richness of quality; also the comparatively shallow depth of the mine, and the economical manner it can be worked, as well as the almost inexhaustible yield. It may be fairly compared with the best of lead mines in this district, taking into account the amount of capital required. The engine-shaft is sunk perpendicular from surface 52 fms.; the lode in the bottom is from 12 to 15 ft. wide, sulphate of barytes, of superior quality, white as snow, with not the least indication of falling off or diminishing in width. The last 4 fms. sinking little of the lode has been taken away other than in the sinking; therefore, putting the lode at the low average—12 ft., it contains 25 tons per cubic fm., or 50 tons for width, showing the last sinking of 4 fms. has laid open at least 10,000 tons of barytes, taking it at 40 fms. long, being the length now driven, and which is only a short section of the lode. The same calculations may be repeated, and by extending the 48 and deeper levels west reserves of an unlimited extent may be opened, and the output considerably increased."

The foregoing clearly shows that we have at least one rich barytes mine in this county. Many parties have visited the property, and they all agree that they never saw such a lode of sulphate of barytes in any part of the world they have visited. In some places the lode is more than 20 ft. wide. Every yard sunk for the length opened (40 fms.) has produced 1000 tons, and when the levels are extended west of the shaft on the lode this quantity per yard of 1000 tons will be increased. The mine is called the Wotherton Barytes, and is carried on by a private company of four. It is situated about some three or four miles to the west of the lead mines here—Tankerville, Roman Gravels, Grit, &c. The output for 1876 (and sold) exceed 4000 tons. What is wanting is extensive grinding machinery to make this one of the best-paying mines, according to capital required.—*Pontesbury, Oct.* 27. ——— S. P.

THE METAL TRADES.

SIR,—The remarks in your last leading article on the state of the metal trades give anyone interested in the production of copper a very discouraging prospect of any amendment of the present depressed prices. The conclusion one arrives at is that the consumption of this metal in all its various forms, large though it be, has been overtaken and exceeded by the production of the metal and the ores which yield it.

In the article tin it would appear that another state of things exists. Though the stocks have been reduced the production both abroad and at home is lessened, and the consumption being large prices are improving. It appears very strange that the large copper mining companies of the world should pour in their immense quanties at a loss or at a vast sacrifice. Take, for instance, Rio Tinto, the New Quebrada, the Panulcillo Mining Companies, as well as some of the South Australian companies, must be selling their ores at a heavy loss. Many of the Cornish and Irish mines the same. The Cape Copper Company are flooding the market with their splendid ores at a sacrifice of an amount of 40,000*l.* or 50,000*l.* per annum, and the Betts Cove and the Union and Newfoundland Mines are selling their produce at wretched prices. The vast quantities of bar copper and rich ore supplied to Chili cannot be sent here with any profit. Surely this state of things cannot last. Mine owners will limit their production, and the markets will then be buoyant once more.—*Oct.* 31. ——— A PRODUCER.

THE TIN TRADE.

SIR,—Judging by the experience of the past few weeks, there seems to be no doubt that confidence in tin having "turned the corner" is all that wanted to bring tin mining into favour again, and to put the price of the metal to a much higher figure than it is at present, and we cannot have greater proof of this than the enormous advance than has taken place in the stocks of such mines as are prominently before the public.

The shares of some of the older mines have increased in value in a few weeks fully 100 per cent., and in some progressive mines the rise has been as much as 500 per cent.

With regard to the metal itself, when it is remembered that money can be borrowed on it without difficulty, it will be seen how easily holders may keep the stock off the market for a considerable rise in price when once they feel that the worst has been passed.

The recent advance, coupled as it is with only moderate signs of a general improvement in trade, shows that stocks are firmly held, and points to a possible further advance and an early return to what may be called a normal condition of prices; and it is more than likely that as the demand improves we shall have a period of high values, such as were current before the recent depression set in. There can be no doubt that at the prices we have had lately the production of tin in Australia has been unremunerative, and any increase in quantity that higher prices may bring us from that quarter will be counterbalanced by the increased consumption consequent on improved trade here and in America.

St. Austell, Oct. 29. J. FLETCHER PAGEN, F.G.S.

THE RISE IN TIN.

SIR,—The recent advance in the tin standards has inspired fresh life into the mining community in West Cornwall, so that the value of stock in the mines has risen with amazing rapidity. Shares which a short time ago were given away are now of value, and the shares of all mines have advanced very considerably. The rise in the standards is about 7*l.* per ton, and many persons are of opinion that a further rise is near to hand. The heavy stocks of tin at Dolcoath, Wheal Owles, &c., will probably ere long be set free to reduce, or entirely liquidate, the bank balance. He must be a bad man who does not rejoice at this change of circumstances, which was anticipated by some people, but not by all. The rise will give good profits in such mines as Dolcoath, Tincroft, South Condurrow, and Carn Brea, and will also greatly augment those of Wheal Eliza, and a few other tin mines, and will probably prevent the relinquishment of some mines which have been showing a loss for a long season. The rise may also stimulate enterprise in other mines than tin. There are many copper and lead mines now idle which would pay good dividends upon a moderate outlay. East Wheal Ellen, in St. Agnes—a copper mine—is such an one, and Phœnix Lead Mine, in Perranzabuloe, is another, and both should be worked at once.

Oct. 30. ——— R. SYMONS.

CHEMICAL REDUCTION OF MINERALS.

SIR,—There are, perhaps, few subjects which have been more thoroughly ventilated in the columns of the *Mining Journal* during the past 25 years than that for the chemical reduction of minerals, by which I mean the extraction of the metals contained by the wet way; and although it has been proved to demonstration that so far as the ores of Cornwall and Devonshire are concerned, and the proof really applies to raw ores generally, every parcel requires a new process, capitalists are still led away with the notion that a general process can be made available. Those who sacrifice their money in attempting to carry out such a project deserve no more pity than they who pursue the chimera of perpetual motion; but the absurdity of the attempt cannot be too often referred to, owing to the immense harm which is done to legitimate mining and metallurgy by those who are foolish enough to lose their money in attempting this impossibility, declaring that the loss has been incurred in one of the industries mentioned. Every chemist knows full well that in order to secure similar reactions not only must the same reagents be used, but the same material must be operated upon. Fortunately nascent chemists are seldom entrusted with the treatment of any mineral of marketable value; but, unfortunately, they pretend to obtain the same results whether the metal is contained in the ore or otherwise. They have plenty of brass themselves, and are fully aware that there are a number of the public quite large enough for their purpose who are unable to distinguish it from the other yellow metal until after the latter has been extracted from their pockets, and who only then, when too late, learn that the extraction of gold from the latter source does not constitute a chemist, nor does it necessitate a long course of study in the laboratory.

Even in localities where there are facilities for carrying out the reduction of minerals by the wet way, and where great difficulty exists in procuring fuel and the necessary labour for smelting the margin of profit when estimated upon each ton, and I do not hesitate to say that upon the treatment of Cornish and Devon ore there is no legitimate profit whatever. That apparent profit can be shown has already been ascertained from their Berdan experience, but that any such rates as 20, 30, 50, or 80 per cent. can be honestly earned has yet to be proved. I will, of course, admit that by the expenditure of a few hundreds for plant and chemicals it is possible, by taking no account of that expenditure, to show the profit mentioned upon the treatment of a few picked parcels of ore, and even to pay dividends upon, perhaps, one-fiftieth of the nominal capital of the company engaged in the operation, but if this be done it would be to throw the total dividend over the total nominal capital. If a company with 50,000*l.* capital, of which only one-fifth is issued, distributes 1000*l.* per annum in dividends, the rate should be stated, whenever the attempt is made to place the remaining capital at 2 per cent. per annum and not at 10 per cent., because the liabilities incurred have been in proportion to the 50,000*l.* capital, and consequently every incoming shareholder buys not a share in a legitimate property but a share in liabilities, which he will afterwards be called upon to pay, because the new funds as they come in are virtually applied to sustain the regularity of the dividends until the unallotted shares have been sold.

During the past half-century so many improvements have been made in the dressing of ores that really it is only in exceptional

cases that wet processes are in this country at least useful. The separation of ores of several metals by dressing is now carried to a surprising degree of exactitude, that it may almost be said that any ore which cannot be made available for smelting is of little value with the wet process; but it will, of course, be understood that this rule is not without exception, and that in the case of the Alderley Edge ores—and, indeed, in all cases where a very small quantity of one metal only is contained in the matrix—the wet process can be profitably carried out, but to attempt to treat a mixed ore in a district where neither fuel nor acid is produced, and to attempt to apply one process indiscriminately, is sure to result in failure. Even in the present depressed state of the metal markets there are few ores which cannot be sufficiently dressed to make them saleable to the smelters, and those which cannot may well be thrown to the attle heap.—*Camborne, Oct.* 29. SMELTER.

GOSSAN DEPOSITS, &c.

SIR,—A great writer states in a letter in last week's Journal that the late Capt. J. Lyle was the discoverer of Carn Brea Mine. Now the fact is that that mine was worked for many years as Wheal Fanny, probably before Mr. Lyle was born. Wheal Fanny was idle for many years, but was taken up again by Mr. Lyle in 1832 3, and the name altered to Carn Brea. Capt. Glanville says his uncle was induced to take up this mine by "examining the large gossan deposit impregnated with carbonate of copper similar to that at Esgair-fraith Mine." I do not know where Mr. Lyle could have seen the "great gossan deposit," as the mine was full of water. I never heard that Capt. Glanville was an underground agent in Carn Brea. I thought the late Capt. W. Roberts was manager of the Bassets and other mines of Mr. Lyle's. Capt. Glanville does not state what the gossan did in East Wheal Basset, or what profit that mine made under his management. N. VINCENT.

Illogan, Nov. 1.

MINING IN NORTH DEVON.

MOLLAND COPPER MINE is being worked as a private company by a few gentlemen from Exeter and Bolton. By those who know the property during its last working, when large returns were made, it is considered a very valuable property, as it can be worked very inexpensively, having shafts and levels laid open, with sufficient water for pumping machinery and for dressing the ores.

At SOUTH MOLTON CONSOLS operations are being rapidly pushed forward, and the water will be shortly in fork at the 12 fm. level, from which immediate returns of silver-lead will be made, the dressing-floors and appliances being all ready. Considering the circumstances under which the mine stopped working, when 230 tons of silver-lead were raised and sold, it can scarcely be called a speculation. Shares are already at a considerable premium, and cannot fail to go considerably higher.

At WEST COMBMARTIN the cross-cut to cut the new lode is being pushed on by six men; at this depth a profitable lode is expected. So far as seen the lode produces splendid gossan and lead. A short time since shares were almost valueless; now there are buyers at 6s. to 7s. 6d., and they will go considerably higher, the grant being extensive, and at a moderate royalty.

Leaving Bristol by the Bristol and Exeter Railway, I soon arrived at Barnstaple, taking coach for Paracombe; on arriving at Loxhore passengers alighted, when an extra pair of horses was put to, with a gentle hint that gentlemen might walk up the hill, which gave me the opportunity of seeing some rich hematite ore, which I was told is being worked by a Manchester company. On reaching the top of the hill we rattled along until Jeremiah pulls up at the top of another hill, drags both wheels, with a gentle hint again—"Would you like to walk, gentlemen?" At the bottom stands an ancient-looking hostelry, called the Fox and Goose, where mine host is all politeness, and ready to substitute apple sauce for the fox, and tea, coffee, or something stronger if you like it—entertainment suitable in every respect. But my business is at the Royal London (only fancy a Royal London Hotel at Paracombe) to meet my mining friends, which was the object of my journey, when, after mutual congratulations, we proceeded to inspect the bal, which quite astonished me when I saw such rich lumps of silver-lead at such a shallow depth. An adit is being driven to intersect the lode further west, where the agent expects to open on a rich deposit of silver-lead. Well may the mineralogist and geologist exclaim—What a splendid spot for a mine is Paracombe! S. R. B.

MANGANIFEROUS DEPOSITS OF DEVON AND CORNWALL.

SIR.—Having noticed in the Supplement to the Journal of Oct. 20 a letter respecting the Manganiferous Ores of North Somerset, well deserving the attention of investors, I am induced to make known the observations which I made in a visit to some similar mines in the neighbourhood of Tavistock and Launceston a few weeks ago. A fine drive of about five miles brought me to Bowden Down, near that remarkable volcanic hill called Brenton, surmounted by the parish church. I found Bowden Down a very centre of manganiferous deposits, having on one side the celebrated manganese mine of Messrs. Simm's, and on the other side the Hangston Mine, which has yielded a rich harvest to a well-known Glasgow firm, the same run of lodes being contiguous from one to the other directly through Bowden Down, where the richest manganese of the district was formerly obtained. I found the old workings had been reopened and the lodes followed into virgin ground for a considerable distance, showing a very large deposit of fine ore, from which had been raised to the surface a parcel of very rich manganese, and also a quantity of manganiferous iron, averaging about 30 per cent. of manganese and 40 per cent. of iron. Several shafts had been sunk, and the mine was completely drained by a long adit. Floors for dressing had just been laid down supplied by a constant powerful stream of water. Altogether I considered this a most desirable property, as the preliminary labour of opening up the lodes was accomplished at considerable expense, and the ore was now exposed to view. I should also mention that the overlay of the ore, consisting mostly of hard clay, strongly impregnated with iron and manganese, and which abounds in almost unlimited quantity, has recently been experimented on, and found to make the finest hard blue brick in the world, even superior to the far-famed Staffordshire. The manufacture of this alone would create a profitable business, and pay a most handsome profit. Leaving this remarkable spot, I proceeded on to Launceston and walked on to St. Stephen's, passing by the celebrated old Attway Manganese Mine, where large fortunes were formerly made, and an immense deposit is known still to exist by the evidence of several trustworthy persons who worked at the mine till it was su-pended.

A little further on towards Langore I came to the mouth of an adit at the bottom of a hill, which I was invited to explore by one of the miners. I accordingly entered, and traversed a working adit for about 120 fms., at the end of which I found opened up a large lode of manganese, apparently free from any iron, and likely to prove of great extent and easily workable. After seeing this, my miner friend conducted me to another property, almost adjoining, but on the other side of the main road, where, having been invited to descend a short ladder, I entered a large cavity, diverging in several directions, and in each discovered deposits of manganese and manganiferous iron. Of the latter there appears to be an immense quantity, containing about 10 to 15 per cent. manganese, and 51 to 60 per cent. iron, besides some containing manganese up to 40 per cent. Of the latter there was then at surface upwards of 150 tons, and also about 200 tons of the lower class.

All these mines belong to the same proprietors, whom I had the pleasure of meeting in the evening at Tavistock, being gentlemen of that place, who I found had been quiety working up these mines to their present position during the last three years, and are now looking forward to some return for their outlay, which they richly deserve, and for this purpose they are now wanting additional capital to employ more labour, and open up the mines on a large scale. When the decadence of tin and copper mining in this district is considered, it is fortunate that new sources of industry are at hand, only waiting the introduction of capital and enterprise to develope an important interest, especially as the increasing demand for steel in preference to iron must necessarily augment the value and demand for manganiferous iron. I have, therefore, great confidence in drawing the attention of capitalists interested in this branch of trade to the properties above noticed, and satisfy themselves, as I have done, by personal inspection, of their value and importance. G.

NOTES FROM THE WEST.

SIR,—The advance in tin has caused a considerable amount of business to be done in tin mine shares; and South Condurrow, Wheal Grenville, Wheal Peevor, and South Frances appear to be coming to the front with increased prospects and returns. Although when the great scheme of converting all the mines on Carn Brea Hill and around into stock (as recently mentioned in the Journal), with a London board and a consulting or advising mining engineer, there may be a grand rush to purchase the stock; but I do not believe there will, and the steady and successful development of many mines in the locality is at present receiving considerable impetus from managers and agents to meet present requirements with credit to themselves and satisfaction to the shareholders. In the neighbourhood of Bodmin mining appears to be entirely abandoned. At Liskeard it is quite cheering to see the animated countenances of the brokers on the announcement of a rise in tin, and all are now anxious for business, Wheal Grenville, South Frances, and Phœnix being favourites, whilst Herodsfoot came in for a good share of attention, having, it is stated, at the present time the longest course of lead in the bottom level yet opened on in Cornwall. West Mary Ann attracts attention, being worked by deep adit level and at small cost, and in a district where good discoveries of lead may reasonably be expected. South Caradon Hill still holds its own, and likely to for some years to come, as a dividend-paying mine. East Caradon, Marke Valley, and a few other copper mines in the locality are still on the drag.

But what a change has come over the scene since the palmy days of mining in this locality, when the late Capt. Clymo was what might be called the king of miners, looked up to and respected by all. I well recollect the times when it appeared to give him great pleasure to distribute the cheques in the shape of dividends, on one occasion I myself received 100*l.* 5s. for a quarter's dividend from one mine. I hope soon to see the like again, as I believe there is a good time coming. The late Capt. Clymo was fortunate in mining, but he brought to bear sound and good judgment; he rarely started or had the management of a poor bal—Fowey Consols, South Caradon, Mary Ann, Trelawny, and Wheal Wrey being among his successfully managed mines. I notice one of the mines in which he was manager and purser—South Molton Consols Silver-lead Mine, North Devon—which is about to be reworked under very favourable auspices in 5000 shares. The secretary being Mr. John Watson, and the manager Capt. E. Hosking, with a good cash balance in hand. During the last working 230 tons of silver-lead was sold, and everything going on swimmingly, until one fine morning the bal knacked in consequence of uncertain rights, since which time the disputed portion of the property has changed ownership. No doubt many residents in Liskeard remember the circumstance, and some few may also remember giving 22*l.* to 25*l.* for a 256th share. I do for one, and intend having it back again with interest by becoming a shareholder in the present company. Do likewise is the advice of—

Oct. 31. RAMBLER.

CORNWALL—ABORTIVE RAILWAY SCHEMES, &c.

SIR,—There have been many railway projects in Cornwall which have "come to grief," a few of which I will mention. In 1836 what was called the Central Railway was one of such projects. It was a line to start from Basingstoke, from a junction there with the London and South-Western Railway, then in course of construction; thence direct to Exeter, Crediton, Okehampton, Launceston, Truro, and Penzance. The Bill was brought before Parliament in 1837, and defeated by its promoters—a most unusual circumstance. In the year 1844 fresh surveys were made, and a new Bill brought in, but defeated also by the opposition of the Cornwall Railway Company, which was formed for constructing the line, now existing, from Plymouth to Falmouth, and that company also failed in their attempt to get an Act, because of the imperfections of the scheme. The engineer proposed to cross the Hamoaze by putting the train on a line of boats, having lifting apparatus on each side of the water. He also proposed to cross Truro river near Lower Newham Quay, and to cross Penzance Creek near Green Bank Hotel—an inadmissible proposition, because of the navigations. Capt. Moorsom was the engineer. In November, 1845, fresh plans, prepared by Mr. Brunel, were deposited, and in the spring of 1846 the Act was passed for constructing the Cornwall Railway. At the same time (November, 1845) fresh plans of the central line were also deposited by Mr. Locke, C.E., but found inaccurate, and the Bill was thrown out either on merits or errors. There was an error of 10 chains in the section, discovered by one of Mr. Locke's testing surveyors, but not corrected in the deposited plans.

The passing of the Act for the construction of the Cornwall Railway, in 1846, put an end for the time to all attempts for a central line. But I should mention that in the year 1845 there was a third project before the public, called the Great Western and Falmouth Junction Railway, which was a line from Exeter to Falmouth; but I am not aware that it came before Parliament, although all the preliminary steps were taken. I was a loser of 73*l.* by this. The Cornwall Railway was not opened till May 1, 1859, the construction having been delayed many years for want of funds, and it would not be in existence now but for the help of the Associated Companies (Great Western, Bristol and Exeter, and South Devon). About five or six years ago an Act was obtained for bringing a central line to Truro, but the promoters after two or three years abandoned its powers. In 1845 Messrs. Simmons and Passingham, the solicitors, Truro, projected a railway from Truro to Trevaunance Quay, St. Agnes, and such was the rage for speculating in railways at that time that the applications for shares exceeded the supply; yet, for some reason unknown to me, this line was never brought before Parliament, notwithstanding all the preparations for an Act. There was a local committee formed, of which Mr. W. H. Paddon was a member, and he was sued for 500*l.*, Mr. John Thompson's charge for survey and plan of nine miles of railway—55*l.* per mile—which Mr. Paddon paid. A more disgraceful charge I never heard of. Had the charge been made the subject of a reference the surveyor would not have received one half of that sum for his services. About 12 years ago it was proposed to connect Redruth and Penryn by a railway. Surveys were made, and the ordinary measures taken for an Act, but the promoters stopped short—the scheme was abandoned, and properly so. About 20 years ago an Act was obtained for a railway from Helston *via* Gweek, to Penryn, which was also abandoned. About 24 years ago an Act was obtained for a railway from Hayle to St. Ives, and renewed three years afterwards, but allowed to expire. A few months ago the Great Western Railway Company opened a railway from St. Erth Station on the West Cornwall Railway to St. Ives, thereby supplying an obvious need. In 1830 the Wheal Vor Mining Company projected a railway from Hayle to their mines, but did not proceed beyond plans. In 1852 the late Wheal Vor Company did a similar thing with the like result. About 20 years ago the late Mr. T. Darke projected a railway from Penzance to St. Just Mines, but did not proceed so far as to get an Act. Since then a turnpike road has been made between those places, so that a railway is not likely to be made. A few years ago a line called the Fal Valley Railway was sanctioned by Act of Parliament, but since abandoned. It was a line to be connected with the Cornwall Minerals Railway in St. Stephens, near Retew, and laid down the Fal Valley, &c., to St. Mawes. Such a line would be non-paying. The line of railway most wanted in Cornwall at present is one from Gwinear-road to Helston and the Lizard, but especially to Helston, and it would be convenient to open a railway connection with Penryn from Helston, which could be done cheaply *via* Wendron Valley.

The existing railways in Cornwall are the following:—Cornwall Railway, Plymouth to Falmouth; West Cornwall, Truro to Penzance and St. Ives, with branches to Portreath and Tresavean for goods only; Redruth and Devoran (1825) Railway, for goods only, Cornwall Minerals Railway (Fowey to New Quay, 1873), for general traffic, with several branches for goods only. The Minerals Railway Company have also a connection with Burngullow Station, on the Cornwall Railway, but that portion is a broad-gauge line, whereas the Minerals Railway is the ordinary narrow-gauge. East Cornwall Minerals Railway (1874) is a line seven miles in length, extending from Calstock to Kelly Bray, near Callington. Liskeard and Caradon Railway extends from the Cheesewring to Liskeard and Looe, used for minerals and goods alone. Lostwithiel and Fowey Railway is in the possession of the Cornwall Minerals Company. The Portreath and Poldice Tramway is an old line (1800) for conveying coals, &c., from Portreath to the mines near St. Day, and the ores to the wharves; not now much used, but still maintained. Formerly it paid well. horse traction. Pentewan Railway is a line from St. Austell, to Pentewan, chiefly used for the transit of china-clay to the quay for export: horse traction. Mr. Treffry's railways are incorporated with the Cornwall Minerals Railway. The late Mr. Treffry was the first chairman of the Cornwall Railway Company, the second was Mr. M. William, and the third Dr. G. Smith, and the next and present Mr. R. Tweedy. It is to be regretted that the lines of railway in Cornwall pay but a small interest on the capital expended.

Truro, Oct. 30. R. S.

NEGLECTED SECURITIES.

SIR,—Amongst the mines in Cornwall at present overlooked I should like to call the attention of investors to the Penstruthal Tin and Copper Mine. The advancing price in the Tin Standards should not be lost sight of, as Penstruthal has only postponed the working of this metal until the price advances. There is an almost unlimited supply of this metal already discovered. The opening of a rich lode in the 46 fm. level is also of importance. Few mines have shown such wondrous results of success in their career as Penstruthal Mine. Should tin again advance to anything like 88*l.* per ton the price at which this metal stood on the formation of the company, few can tell at what figure these shares will stand in the market. The great reduction in the working expenses ought to be remembered, and the services of Capt. Teague ought not to be forgotten either. It is stated on good authority that Penstruthal Mine has at several different times of working returned over half a million sterling in profits to the shareholders. The district, situated close to Redruth, and in the very pick of the rich measures, entitles the mine to the first consideration. Little doubt exists of a very early and substantial discovery of copper ore, large beds of very rich ore being known to exist in the sett, as repeatedly proved. The productiveness of the Gwennap district is almost fabulous, the entire supply of copper, ere the discoveries in the Chilian mines and Lake Superior, &c., being nearly maintained from here. In 1856 the United Mines eastward of Penstruthal, on an extension of the same lodes, made nearly a quarter of a million in profits. VIATOR.

CARDIGANSHIRE MINES.

SIR,—Had I not been unwell I should have written last week to thank "Old Miner" for bearing testimony to the energy and ability of the Francis family, and intended to have corrected his mistake as to my having anything to do with the management of the Cambrian Mines, but I find Capt. Glanville has done so in a post-script to his letter, which appears in last week's *Mining Journal*. As to the discovery at Esgair-fraith, I would just offer a word or two to say that the real value or importance of the discovery cannot be known until the lode has been cut through, and as about 6 ft. of it as yet has only been seen we must see what the other 14 ft. will do before its real value can be ascertained. I believe the vein will be found rich throughout, although, probably, not so rich as the part that has already been seen and proved.

I will next offer a few remarks on the Tyn-y-fron Mine, where a rich course of lead has been found on the south wall of the lode, and which must stand all unworked throughout the mine. So that, in addition to the very rich lode of blende, lead, and copper before discovered, this discovery would alone make Tyn-y-fron a rich and leading mine for lead alone. The junction of a very fine lode about 3 ft. wide, and rich in copper ore, running 30° east of north with the main lode, can well account for the rich deposits of metallic ores in the mine; and here, also, we have another instance of these ores being overridden by as fine a gossan as any miner would wish to see. The next neighbour, the old Ystymtyhen Mine, has lately made great discoveries of ore, and is looking much better. Good discoveries of ore, also further east, at Penrhiw (the Aberystwith Mine) have recently been made, whilst in the adjoining mine, still further east, the Temple, very rich courses of ore are being laid open in the different levels. I wonder how this latter discovery has not been duly reported in your columns. At Blaen-y-ffryn Mine, lying midway between old Goginon and Cwm Brwyno, a good discovery of rich silver ore has been made on the junction of two veins, one running 30° south of east, the other 30° north of east, and is likely to be attended with good results. At New Tyllwyd, also, a good paying lode has been met with. At Court Grange Mines a fine course of silver-lead ore has been found in the adit, which can be worked cheaply, and should leave good profits. At Blaen Cael, west of the Cambrian Mines, also, a new find of lead ore has been met with; and, taking the prospects of the Cardiganshire Mines as a whole, they have not presented such a "pleasant picture" for many years past.—*Aberystwith, Oct.* 30. ABSALOM FRANCIS.

LEAD MINING IN KESWICK DISTRICT, CUMBERLAND.

SIR,—Your correspondent, "Engineer," writing in the Journal Oct. 13, referred to the lodes and workings of the Blencathra Saddleback Silver-Lead Mine, which is situated about a quarter a mile from the village of Threlkeld, and about three-quarters of a mile from the railway. The picturesque village of Threlkeld is situated at the foot of the elevated range of Blencathra mountland, and on the turnpike-road between Keswick and Penrith. The village provides ample house accommodation for a large mining population, as well as other advantages rarely met with in districts where mining is in its infancy, as in this neighbourhood. The natives are of agricultural life, while the gentlemen cultivate scenery. The Saddleback Mines are worked by a public company, who have carried on the operations at the mine with that spirit and energy often witnessed in mining districts. As your correspondent already said, 30 years ago large returns were made from this mine. Very highly remunerative dividends were paid for a long period, till larger deposits of silver-lead became exhausted. This being so, no railway or shipping port near, the mines were closed for a time. During this period of cessation the Cockermouth and Penrith line was made, and which runs, as before stated, three-quarters of a mile distant from the mines. The mines were again leased to the present company, who operated in driving the different levels, some months after which a large body of ore (galena) was struck; the shares have advanced fully 100 per cent. There being no reducing, jigging, or dressing machinery on the mine to wash the ore, and render it marketable, the solid lumps only were selected for the smelter. These lumps had to be broken down by that old system of hand-labour, the bucking-iron; nevertheless, with all these disadvantages, large returns were made until a short time since. The miners at the present have again come upon a large deposit of galena, now valued at per fathom. Doubtless the mine will ere long resume its former position and with proper dressing machinery will become a profitable and valuable undertaking.

The lodes, five in number, are large and masterly, and being of easy character admit of quick development. They are in most places well mixed with ore, and often carry a solid leader on one or other of the walls. These lodes become compact in depth, as will be seen by the Woodend vein. The bottom level is about 100 fathoms deep from surface; the lode here is more compact than anywhere else, with a solid leader in the sole of the level about 1 ft. wide.

Your correspondent says the middle level is driven 130 fms., and for the last 10 fms. there is good ore ground, which would pay well were there crushing machinery. I would tell your correspondent that were there crushing machinery I would take the middle level at a tribute of 6s. 8d. in 1*l.*, and be bound to work the level 30 fms. long, and as high as the surface—probably 70 fms., and would contract to drive the end on the same terms; hence the value of

property. The mineral wealth of the district may not be generally known, as the mines have hitherto been wrought by private companies; therefore, the public are generally excluded from large dividends being declared at these mines. Take, for example, the Greenside Mine, in this neighbourhood from which large dividends have been paid for the last 30 years—probably 20,000*l.* per annum. There can be no shadow of doubt of these mines continuing to pay highly remunerative dividends for another generation. (For returns, see Hunt's "Statistics"). In conclusion, capitalists should visit this important mining district, where many shallow and good mines are now dormant.

TOURIST.

SOUTH CONDURROW, AND WHEAL GRENVILLE.

SIR,—Let me take in order the correspondents who, in last week's Journal, remark upon my former letter. With respect to Thomas B. Provis, his disclaimer was quite unnecessary, as no one who knows him would imagine that he was the writer of the letter he is so anxious to repudiate. Coming to "A Gnome," I fail to see that he has disproved any of my statements. He goes into figures showing the weekly value of the ends of all the levels in South Condurrow from January, 1875. What has this to do with the respective and aggregate returns of tin from each level? I wrote that, compared with the 72 and 82 fm. levels the 93, or bottom level, has been a poor one; and I do not think anyone who knows the mine will dispute this. With respect to the mine lasting 50 years, I hope it may, and I also hope that "A Gnome" and myself may live to see it, but I shall, nevertheless, treat the matter as a *Rich* joke. In regard to Wheal Grenville I am well aware of there being an adit in South Condurrow and not in the former mine. My statement was that the South Condurrow lode cannot be in Wheal Grenville at the 90, because at that depth a cross-cut was driven some years ago up to the boundary without anything beyond some branches being met with. I further said that the lode probably comes into Wheal Grenville at or about the 100, and I advised a cross-cut at the 120, under the 90 cross-cut, to prove the ground westward between the 120 and the point at which the South Condurrow lode enters the sett. "A Gnome" tells us that the lode does not exist in Wheal Grenville at the 120. If this should prove a fact, gloomy indeed is the prospect of the future for the Wheal Grenville adventurers; I am, however, of opinion that the lode does exist at the 120, westward of the north shaft. I am told that I am wrong in saying that the 130 has been the best level on the South Condurrow lode at Grenville, and "A Gnome" mentions that the 160 was *once* valued at 1 ton of tin per fathom. I do not doubt it. I once heard of the 150 being worth at the rate of more than 1 ton of tin per fathom, but it did not hold for 6 ft. Did "A Gnome" ever hear that about twelve months ago there was even a better lode than this in the bottom of the 130 from north shaft? These isolated values, however, are no proof of the general productiveness of the levels. Take the aggregate value of the ground worked away in each respective level, and unless I am very wrongly informed the 130 will be found to have been the best level, and that the tinstuff has gradually fallen off in value at the deeper levels. Months ago I saw in the Journal that Capt. Hodge had admitted the latter fact at a general meeting. "A Gnome" enquires if I have forgotten, or if I ever knew, that the old lode (which the adventurers are led to believe will greatly enrich the flat lode when the two form a junction at the north shaft) has produced seven eighths of the tin the mine has ever returned? I have long known what that lode has produced, and I am assured by excellent authority that the lode never yielded any tin to value during the whole course of sinking upon it either in the western or northern shaft, a combined distance of 280 fms. I am also well informed as to where the productive ground on that lode was met with. I was on the mine in 1871 when a sale of tin took place, if my memory serves me, amounting to more than 1600*l.*, being one month's return from that lode, and an amount which I am told has never since been equalled at the mine.

I can also assure "A Gnome" that I have long been aware that the productive part of this old lode is worked out, and am inclined to think that had the fact of its near exhaustion been known to certain parties two years ago they would not have been so anxious to burn their fingers in turning out the old agents, and getting the mine into their own hands. It was swift and energetic action on their part, but the shrewdness and foresight laid, I think, in another direction. And now with regard to the junction of the lodes below the 160, at the western shaft, which is sunk perpendicularly on the course of the old lode. The South Condurrow lode, if I have been rightly informed, was first intersected in September, 1872, by a cross-cut 19½ fms. long from the 140, on the old lode, at the western shaft alluded to; the lode when cut through was found to be worth 30*l.* per fathom, and continued good for about 14 fms. east and 4 fms. west of the intersection. Subsequently the former agents put up a rise upon an excellent lode in back of the 140, and drove a cross-cut from the 150, on the old lode, to meet the rise and open a 130 on the South Condurrow lode. If "A Gnome" will take the trouble to inquire, I think he will find that a large portion of the tin raised in the mine for many months past has been obtained from this 130.

The South Condurrow lode was next intersected by a cross-cut 10 fms. long from the 150, on the old lode, and was found at this point worth 40*l.* per fathom; the run of good tin ground lasted about 10 fms. east and a short distance west at this level. At the 160 the lode was met with after a very short cross-cut, and found worth 35*l.* per fathom; the rich ground lasted here about 6 fms. east; westward the lode became poor almost immediately after its intersection. After sinking the shaft 8 ft. below the 160 the junction of the two lodes (*i.e.*, the South Condurrow and the old lode) commenced, and at this point the tin ground was of about the same value as the South Condurrow lode was when cut through at the 160—35*l.* per fathom. There was no improvement whatever caused by the junction in which the shaft was sunk 3 fms. deeper, when the lode began to show less favourable indications. It was expected that 5 fms. more sinking would have reached under or through the junction; that point, however was not reached, for the water overpowered the engine, and the bottom of the shaft has never been seen since. From conversation I have had with parties who saw the lodes at the junction, I am of opinion that had it been possible to have sunk the other 2 fms. alluded to the result would have been favourable. It appears to me that from the 140, where the South Condurrow lode was first cut—holding up to and above the 130, and down to the junction of the lodes below the 160—was a pipe of good tin ground in the shaft, but gradually diminishing horizontally both east and west of the shaft at each level, its length at the 160 as the junction was approached being much less than at either of the upper levels. I much doubt if the latter level has for a long time past been worth prosecuting. This pipe of tin ground, I am strongly of opinion, is greatly impoverished at the junction, if not wholly destroyed, by the contact of the old lode.

I saw it stated in one of our local papers that at the last general meeting the manager said that so anxious was he to see this all important junction that he sometimes felt that he could drink up the water that so cruelly hides the object from his view. If he would forego the dismembering that befel Baron Munchausen's horse he might, perhaps, be able to accomplish the feat; but if he is so very anxious to know the facts of the case, the sources of my own information are open to him. If this feature is considered of such importance, why was not the new engine erected upon this shaft, which is in an almost central position on the flat lode? Why is the mine being placed at a shaft 14 fms. only from South Condurrow Secondary, and which shaft had to be sunk some 12 or 15 fms. before the other junction of the lodes could be reached?

As I said in my former letter, I would advise the adventurers not to indulge in any sanguine expectations in regard to this junction yet. Below the 130, at this shaft, the South Condurrow lode has never presented such favourable appearances as it did at a corresponding depth from the western shaft, and taking this into consideration, and what is known of the effect of the first junction, it is undesirable to hope for a more satisfactory result when the second junction is reached. As I said before, no one can say positively that it will be a failure; the lodes may change in character as they approach each other, and their union may be a happy and productive one, but I do not look for such a result. Until I am convinced to the contrary by a good and permanent discovery in the lower levels, I shall adhere to my opinion that the chances of Wheal Grenville are shallow and not in depth, and this might have been proved without the expenditure of a shilling for additional machinery.

Camborne, Oct. 31. PETER PROVIS.

CATHEDRAL MINE.

SIR,—Is this mine going to be taken away from us? I was asked to subscribe for the new shares that were issued some time since, and I did so. And I believe there is still a small amount due upon them which I have never been asked for. If the company wanted more capital why were not the shareholders applied to for it? Or has the mine been purchased by someone who has been waiting to get it?—*Oct.* 31. A DISSATISFIED SHAREHOLDER.

NEW CHARLOTTE, &c.

SIR,—I am sorry to hear that this mine, upon which Mr. Elisha Tregellas bestowed so much labour, is to be wound up. It is a great pity that such a kindly mine should be suspended for want of capital to prove it fully. I also regret to hear that the Perran Iron Mines are likely to be suspended. There was, I am told, no pay on Saturday. It has been said, too, that the iron ore is not of sufficient produce to pay for extraction, but I cannot certify the correctness of this information. Another gentleman gave me a different account of it.—*Oct.* 30. R. S.

MINING IN MONTGOMERYSHIRE.

SIR,—Your correspondent "J. D." and myself can shake hands, and say—"Brother, brother, we are both in the wrong"—for he said "local enterprise" when he meant "private enterprise" as the means by which the mines were being developed in this county, and I, in writing on the same subject, rambled about, and somehow or other got over the boundary into Cardiganshire. But with the view of saving some portion of my reputation for accuracy I will give my reasons for saying that the boundaries of the Cambrian and Hyddgen Mines run together for some distance, and that the Esgair-fraith lode of the former is in the latter for the whole length of the sett.

The adit level on the lode is driven west into the Cambrian sett from the side of the Afon Llechweddmawr, close to a house called Lluest-grafian. About ¼ mile north of this house, on the other side of the stream, is another house, called Lluest-y-rhos, and about ¼ mile north of this house the northern boundary of Hyddgen starts from the stream, and runs nearly due east for a distance of three miles, and as the Esgair-fraith lode also runs nearly east and west it follows that it and the boundary line I have just described run parallel for the distance named. In addition, I have heard that the lode has been found in two places in Hyddgen, and if "J. D." will visit that mine I feel sure that the agent—Capt. Davies—will soon satisfy him that I am right on this point.

That a development of the great wealth which exists in the mountain would be of incalculable benefit to this town cannot be questioned, but if the inhabitants wish to reap that benefit, they must persuade the local authorities to pay a little more attention to the road, and a little less attention to the purity of the water flowing from the dressing-floors. Indeed I would recommend the disappointed fisherman, if there be any such, to try the roads for a change, for I think he would find excellent sport in some known to—

Machynlleth, Oct. 30. CYMRO.

CHINA-CLAY AND CHINA-STONE.

SIR,—Much has lately been said respecting these two important articles of commerce, which Cornwall almost exclusively supplies—they are sold and used in the Potteries, England, Wales, and Scotland, as well as America, Spain, and other parts of the world, for china and earthenware. They are also used largely in the manufacture of paper and linen goods. In fact, a very respectable and profitable market exists for the above articles, provided there is good management. What is the fact? Jealousy and bad feeling brings competition, and competition gives all the benefit to the manufacturers of the world, who care but little or nothing about it. The profits that ought to go into the producers' pocket are dissipated over the world, with no thanks or any gratitude from anybody, or from any set of men. Thousands yearly are thus shut out from reaching the pockets of those who have invested their capital and given up their time and attention to these productions. The business of producing clay and stone is unlike copper and tin, which must be smelted, and it only requires a true and sincere combination of the parties concerned to bring in a profit not now attainable. Is it not worth while, therefore, to organise such a combination, instead of running each other down in price, which is of daily occurrence?—*Oct.* 29. A CORNISHMAN.

[For remainder of Original Correspondence, see to-day's Journal.]

THE ROTHSCHONBERGER WATER-ADIT.

After 33 years of uninterrupted labour the great undertaking of the Rothschonberger water-adit is so far completed as to admit of its use. The method of draining the Freiberg mines by means of a deep tunnel had already been discussed in the beginning of the present century as a question of necessity for the future mining prosperity of the vicinity; and, undoubtedly, the Rothschonberger tunnel is the greatest work of the kind that has ever been undertaken to aid the exploration of a mining district. Other great adits, such as those of the Hartz Mountains, and the famous Sutro Tunnel, fade when compared with a tunnel which has already attained a length of more than 26 English miles, and will be with its branches, when completed, more than 31½ miles. The plan was to conduct the water from the Freiberg mines to the nearest practicable point on the River Elbe. Rothschonberg, about 7½ miles above Meissen, was chosen as the most advantageous place for the mouth, on account of its having the lowest level at the shortest distance from Freiberg. The preliminary surveys were made in 1843, but the work was not thoroughly taken in hand until the third quarter of 1844. Since that time the driving of the tunnel has been unceasingly carried forward, but has met with many hindrances and difficulties, such as quicksands, immense quantities of water, &c., which have trebled the cost and retarded its completion. The tunnel is ventilated by eight air-shafts, and lies some 400 ft. below the deepest Freiberger water-adit. It has a uniform height of 9·84 ft., with a somewhat smaller breadth. The present length of the adit with its ramifications is about 25 miles (all of which length is now in use), and will be when completed over 6 miles more. The cost of the tunnel is estimated at 600,000*l.*, and will be paid for by a tax on all the mines which it directly benefits. The gradient of the floor is only 1 in 33. This small gradient may make it necessary to clear the tunnel occasionally, but this can be accomplished without difficulty with suitable boats and dredges. For 5 miles this tunnel is perfectly straight, without the slightest curve, and along the whole length the curves are very light. One rather interesting occurrence during the past year was the striking of an old mine, of which no maps are in existence. This mine is probably more than four centuries old, and the timber which had been used as supports, &c., was found for the most part sound. Two new veins were also struck, but only one of them will be explored. It is rather remarkable that nearly the whole driving of the tunnel has been done by hand, Burleigh drills, driven by compressed air, having been introduced only within the past year. The rock throughout nearly the entire length is solid gniess, which accounts for the time that has been taken to the work, it being necessary, with hand boring, to put in as many as from 40 to 50 holes to the face.

The necessity for the continued prosperity of the Freiberg mines, which have now been worked for about seven centuries, may be gathered from the fact that at the present time there are more than 6000 labourers, with their families, amounting altogether to some 20,000 persons, who derive sustenance from the mines and metallurgical works connected with them. It may reasonably be expected that the Rothschonberger tunnel will give fresh impetus to the Freiberg mining, and considerably augment the output of ore, which has of late years somewhat fallen off, owing to the immense quantities of water which continued to flood the mines, and prevented the veins of ore being followed and worked below a certain depth. Saxony may well and justly be proud of a tunnel which is without doubt the longest in the world, and which has required so much time, perseverance, skill and labour as the Rothschonberger water-adit.—*Iron.*

Registration of New Companies.

The following joint-stock companies have been duly registered:—

MORFA DU MINING COMPANY (Limited).—Capital 11,250*l.*, in 1*l.* shares. To purchase of the Parys Mountain Mining Company (Limited) their leasehold interest in a part of the mineral property known as the Parys Mines, Anglesey, which property is held under a 21 years' lease from July, 1870. The subscribers (who take one share each) are—F. Braby, Mount Henley, Sydenham Hill, metal merchant; S. W. Daukes The Knoll, Beckenham, no occupation; F. F. Wilson, St. Helen's place, secretary; J. Y. Watson, St. Michael's-alley, mine owner; W. Allen, Colemore road, Peckham; N. F. Watson, St. Michael's-alley, sharedealer; Alexander Kerly, 14, Great Winchester-street, solicitor. The qualification for a director is 100 shares.

EVINGTON COAL BORING COMPANY (Limited).—Capital 7000*l.*, in 5*l.* shares. To bore for coal, fire-clay, and other minerals, and to acquire and work certain land at Evington, Leicester, the property of the Rev. T. G. Burnaby. The subscribers (who take one share each) are—C. S. Burnaby, Gamston Manor, East Retford, solicitor; T. Wagstaff, Retford, land agent; G. A. F. Fowke, Conservative Club, gentleman; J. F. L. Rolleston, Leicester, land agent; William Barfoot, Leicester, merchant; H. Hughes, Leicester, engineer; C. Stretton, Leicester, solicitor.

NEW ZEALAND LAND AND AGENCY COMPANY (Limited).—Capital 1,000,000*l.*, in 10*l.* shares. To acquire the interest of John Broomhall, Esq., J.P., in 50,000 acres of land on the Te Archa Block, Auckland, New Zealand. The subscribers (who take 250 shares each) are—J. Broomhall, The Manor House, Penge; J. Spencer Balfour, Willow Lodge, Croydon; J. Henderson, Glasgow; William Isaac Selwood, Forest Hill; Thomas Short, 115, Cornwall road, South Kensington; J. Taylor, 5, Tokenhouse-yard; Sir Julius Vogel, 127, Cromwell-road.

HANDS' AFTERNOON TEA COMPANY (Limited).—Capital 50,000*l.*, in 5*l.* shares. To acquire the business of Arthur Hands, of Eastcheap, dealer in fine tea, &c. The subscribers are—W. J. Almond, 9 and 10, Little Britain, 10; J. J. Joseph, 17, Bridge-road, West Battersea, 5; J. Lowe, 12, Southampton-street, Strand, 2; J. C. Laurance, 1, Stanhope Villas, Bloomfield-road, W., 2; A. Hands, 46, Eastcheap, 10; John Hawke, Banbury-terrace, South Hackney, 2; John Powles, 291, Hackney-road.

GLOUCESTER TRAMWAY COMPANY (Limited).—Capital 50,000*l.*, in 10*l.* shares. To construct a tramway in the city of Gloucester. The subscribers (who take 10 shares each) are—William Roebuck, West Lodge, Acton; Wm. Mousley, Clifton, near Bristol; W. Temple Bourne; A. H. Sanderson, 8, Clement's Inn; Sir Wilford Brett, Esher; William Barfoot, Leicester; Clement Stretton, Leicester.

BERTHON BOAT COMPANY (Limited).—Capital 5000*l.*, in 5*l.* shares. To manufacture patent Berthon canvas and other boats and floating machines. The subscribers are—John Tait, Enfield, 5; E. L. Berthon, Romney, 1; G. E. Price, M.P., 39, Osborne Gardens, 1; E. P. Berthon, Woolston, Southampton, 1; W. H. Shepherd, 30, Bedford-row, 5; E. Field, 30, Bedford-row; P. R. Langdale, 30, Bedford-row, 5.

TAFF WELLS GAS AND WATER COMPANY (Limited).—Capital 5000*l.*, in 5*l.* shares.

WILSON, SONS, AND COMPANY (Limited).—Capital 250,000*l.*, in 100*l.* shares. To purchase the business of Messrs. Wilson, Sons, and Co., merchants, agents, bankers, &c., of London, and the similar business carried on at Rio by E. P. Wilson and Co., in Bahia by Messrs. Wilson and Co., in Pernambuco by Wilson Brothers and Co. The subscribers are—E. P. Wilson, Bahia, by his attorney, 250; E. P. Wilson, Rio, by his attorney, 250; J. P. Wilson, Bahia, by his attorney, 125; A. P. Wilson, 57, Gracechurch-street, 125; E S Hert Rickville, Parkgate, Chester, 250; D. C. Scott, Pembridge Gardens, 250; H. H. Hutt, Irwell Chambers, Liverpool, 125.

STRAITS SUGAR COMPANY (Limited).—Capital 30,000*l.*, in 500*l.* shares. To acquire from T. Watson Mackie, of Penang, the rights vested in him of a patent known as Weinrich's Patent Centrifugal Machinery for improvements in the manufacture of sugar, &c., for the colony of the Straits settlement The subscribers (who take one share each) are—John Beattie, Dumfries; Alfred Fryer, Wilmiston, Cheshire; J. B. Macfarlane, 24, Long Acre; J. M. Purvis, 24, Nicoll-road, Harlesden, 3; J. J. Horsley, 7A, Gracechurch-street; Walter Oldham, Clarendon House, Roupell Park; F. W. Mackie, 26, Bedford-place; John L. Souther, 3, Carlisle-terrace, Shepherd's Bush.

GREAT EASTERN GLACIARIUM COMPANY (Limited).—Capital 15,000*l.*, in 1*l.* shares. To acquire the license under the patents granted to M. R. P. Pitet, of Geneva, for improvements in the production of cold and in the manufacture of sulphurous acid, so far as relates to the Presidency of Bombay. The subscribers (who take five shares each) are—R. A. Rowe, 10, St. Leonard's, East Sheen; H. E. O'Reilly, 6, Roseford Gardens; W. T. Killam, 26, Guilford-street; M. Hearn, 80, Coleman-street; J. Davis, 2, Harley Gardens; S. E. Gunyon, Victoria Grove, Stoke Newington; T. Bishop, 10, Seven Sisters-road, N.W.

KEIGHLEY MARKET COMPANY (Limited).—Capital 20,000*l.*, in 5*l.* shares. To acquire and carry on the management of Keighley Market, at Keighley, Yorkshire. The subscribers are—Robert Lister, Keighley, 16; Wm. Mann, Keighley, 60; J. Rhodes, Keighley, 16; A. L. Rhodes, Keighley, 40; John Smith, Keighley, 148; John Taylor, Keighley, 40.

OAKWELL SOAP AND DRYSALTERY COMPANY (Limited).—Capital 5000*l.*, in 5*l.* shares. To acquire the business of the firm of Crouther and Co., of Burstal, soap manufacturers.

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week there has been a fair amount of business transacted. The revival in business is so well sustained that there are hardly any found now who doubt its permanency. Prices in all departments, therefore, have a strong upward tendency, so that those who buy quickest will profit most. The only reductions in prices of any extent are noticeable in the colliery and iron shares, but the amount of shares on the market is so small that it is easily seen the parties offering them merely do so to put down the prices, being in reality buyers. In shares of iron and coal concerns Bolckow, Vaughan, A, have advanced 10s. per share, and Cairntable are wanted at a further advance of 5s., while Nant-y-Glo and Blaina (pref.) have fallen 15s. Monkland (pref.), 10s.; Benhar (both classes) and Ebbw Vale each 5s.; Scottish Australian, 2s. 6d.; and Monkland, 1s. 6d. Lochore and Capledrae have steadied at 50s.; unless they can get rid of the "white horse" on their seam the colliery will never come to anything, while if they do get the better of it the shares would prove a remunerative speculation. A call of 50s. per share was due on Oct. 29 by Ivy House and Northwood shareholders. Altami are at 80s.; Andrew Knowles and Sons, 55s. prem.; ditto (25*l.* paid), 30s. premium; Bolckow, Vaughan, A, 53½; ditto, B, 33¾; and ditto (pref.), 20½. Chapel House, 60s.; Chillington, 75s.; Darlington, 11¾ dis.; John Bagnall and Sons, 65s.; Nant-y-Glo and Blaina (pref.), 19 to 20; North of England Industrial, 30s. to 40s.; Oakham, 10s; Pelsall, 60s.; Sandwell Park, 19; Scottish Australian, 36s. 3d. to 40s.; ditto (new), 7s. 6d. to 10s.; Sheepbridge, 10¼ dis.; Silkstone and Dodworth, 20s. dis.; Spon Lane, 60s.; Swansea Valley, 60s.; Tredegar, A, 10½ dis.; Walsall Wood, 27s. 6d. dis.

In shares of foreign copper concerns, Huntingtons have been dealt in at about 1s. 6d. advance, while Tharsis now quoted ex div. are about 5s. lower for fully paid shares. Copiapo are at 13 dis. Hultafall, 80s. New Quebrada, 40s. Panulcillo, 32s. 6d. Yorke Peninsula (ordinary), 4s. to 6s.; ditto (pref.), 17s. 6d. In shares of home mines the rise in tin makes shares in tin mines in principal demand, and though there has already been a good rise, they have ample margin to go much higher. South Condurrow, on which a 10s. dividend is expected next time, appear cheap. Lead shares also attract a fair amount of attention. The report given at the meeting of Combmartin, referred to in last week's Journal, was considered a good one, and the mine likely to turn out well, but there were only four shareholders present. Glasgow Caradon is 1s. lower, while the new shares are unaltered. Aberdaunant are at 6s. Bampfylde, 5s. Cambrian, 40s. Combmartin, 5s. Denbighshire Consols, 31s. 3d. Derwent, 40s. Dolcoath, 39. Elgar, 20s Glenroy, 15s. to 17s. 6d. Glyn, 10s. Great West Van, 3s. Grogwinion, 65s. Killifreth, 3s. 9d. Leadhills, 5 to 5¼. Llanrwst, 55s. Medlyn Moor, 30s. North Laxey, 11s. 3d. Pandora, 20s. Parys Mountain, 11s. 6d. Pennant, 80s. Penstruthal, 6s. Prince of Wales, 5s. Rookhope, 20s. 6d. to 21s. 6d. St. Harmon, 45s. South Condurrow, 9 to 9½. Tincroft, 16½. Van Consols, 1½. West Assheton, 15s. West Craven Moor, 9. West Tankerville, 17s. 6d. Wheal Agar, 80s. Wheal Grenville, 75s.

In shares of gold and silver mines, Richmond continue to advance, being 25s. higher on week. The run is steady, at $55,000 per week. Hunter Consols reports $9000 as its run; the shares are not much known yet, though it is understood to be under superior management. Almada and Tirito are at 5s. to 7s. 6d.; Antioquia, 11s. 3d.; Eberhardt, 5¼; Emma, 1s. 3d.; Exchequer, 6s. 3d.; Flagstaff, 45s.; Frontino and Bolivia, 60s.; I.X.L., 7s.; Last Chance, 17s. 6d.; Malabar, 2s. 9d.; New Zealand Kapanga, 25s.; Richmond, 7½ to 7⅝; Santa Barbara, 23s. 6d.; Sierra Buttes, 30s.; South Aurora, 4s. 6d.

In shares of oil companies the tendency is rather to droop, owing to petroleum falling. Uphall are reduced 6s. 3d., and Young's Paraffin, 3s. 9d. Runcorn Soap and Alkali are 6¾ to 6¼ dis.

Miscellaneous companies shares are unaltered. Birmingham and Midland Counties Val de Travers are quoted 22s. 6d.; Milner's Safe, 7⅛; New Victoria Salt, 18; Phospho-Guano, 10⅛; and Scottish Wagon, 11¼. In wagon companies, Gloucester are at 10¼, and Starbuck 11½ to 12. Chemical companies shares are quoted:—Lawes, 7¼; Langdale's, 80s. to 82s. 6d.; and Newcastle, 42s. 6d.

On Contango-day the following were the rates of continuation current:—Contangos: 1d. on Glasgow Caradon; 1d. on Glasgow Port Washington; 2d. on Marbella; 2d. on Oakbank Oil; 3d. on Richmond; 9d. on Uphall; 9d., 6d. on Young's Paraffin.—Backwardations: Even, 1d. on Huntington; 3d. on Omoa and Cleland; 1s., 1s. 3d. on Tharsis. Even, Monkland Iron. On comparing the making-up prices of the undermentioned shares for the account now ended with those of the previous account the following variations are shown:—Richmond have advanced 31s. 3d. per share, and Huntington 6d.; Marbella, Monkland (pref.), Oakbank, ditto new, and Tharsis (new) are all unaltered, while Monkland have fallen 6s., Glasgow Caradon 3s., Glasgow Port Washington and Uphall each 2s. 6d.; Canadian Copper, 2s.; Tharsis and Young's Paraffin, each 1s. 3d.; also Omoa and Cleland, 6d.

DYNIN SLATE QUARRIES.—These works are situated, according to some particulars issued in connection with an application for 6000*l.* on First Mortgage Debentures, in the county of Cardigan, North Wales, about one mile from the navigable River Dovey, and the Glandovey Station on the Cambrian Railway. The quarry is not far distant from the celebrated Corris Quarries, which it is said are paying over 100 per cent., showing that a good slate quarry can be a most lucrative investment. This particular concerns prospects to rank as a remunerative investment are based upon its vein of slate rock of half-a-mile in length, and about 150 ft. in width, producing metal of good quality, colour, and cleavage, an ample space for "tipping" the

rubbish, unlimited supply of water-power, and great economy of transit. The debentures are to be 20*l.* each, bearing 10 per cent. interest half-yearly, redeemable at par by annual drawings commencing in 1880. The particulars, singularly, make no mention of what ordinary share capital has already been expended by the company issuing the debentures, who the directors or officers are, or even what public authorisation it comes under.

CANADIAN COPPER AND SULPHUR COMPANY (Limited).—At the ordinary general meeting of the shareholders of this company on Wednesday, owing to the documents necessary to make up the report not having arrived from Canada, it was agreed to adjourn the meeting till December 12.

NEW ZEALAND.—We find the following information about the minerals in the district of a block of land of not less than 50,000 acres (say 78 square miles), which is proposed to be acquired by an English Land and Agency Company. The report is by Mr. J. Broomhall, J.P., who has travelled more than 3500 miles in the colony. The land is sixty miles from Auckland, and fifty miles from the sea, being situated on both sides of the River Thames. His report states that—"Gold in great abundance, with copper, tin, lead, arsenic, mercury, and antimony, have all been discovered on the right bank of the river, within twenty miles of the block; in fact, the river and estuary skirt the great gold fields of the Thames, Coromandel, and Ohinemuri, from which, in 187-, gold of the value of 277,767*l.* was extacted, and in the last 20 years a total of 3,789,439*l.* . . . . . Near the mouth of the Thames coal is found from 9 to 30 ft. thick, and it is affirmed that it produces 6000 ft. of gas per ton more than the Sydney coal. Hematite ore is also found in large quantity, and the Government analyst reports this ore to contain metallic iron, 62·30; oxygen, 27·04; silicates, 10·66; manganese and titanium, traces. The colony imported coal in 1875 to the value of 246,536*l.*, and it requires but capital and labour to dispense with this import, there being sufficient coal in the colony to supply it for centuries."

CAUTION.—Circulars are being issued broadcast at present, offering shares either perfectly worthless, or at prices far above what, such of them as are marketable, would fetch in the market. That such effusions should deceive any person of average intelligence may appear strange, if one does not know the numerous class of investors, either entirely ignorant of mining matters, or at least with a slight knowledge only, who at a time like the present, when markets offer to become very brisk, are open to buy almost anything in order to have a share in some speculation in our great mineral resources. The unsatisfactory state of the law in England, as compared with Scotland, so far as regards public prosecutions, is much to be regretted, and the only protection investors have is not to do any business before consulting an intelligent broker of whom they have a thorough personal knowledge; the mining interests will then be much benefited, and the investors themselves also much more so, by getting the experience practically free of cost, which, by taking their own counsel, will eventually for a certainty cost them hundreds or thousands of pounds, according to the extent of their transactions.

In a recent Journal (Oct. 20) a letter of "R.B.," Lloyd's, gave a practical illustration of the truth of these remarks, and we are aware of other operations of the same and other clever impostors, which would have been the bases of criminal proceedings but for the law as regards such in England at present being practically framed in many cases rather so as to protect the criminal from justice than to secure redress for those aggrieved. We hope none of the readers of the Journal have been taken in by "Bond and Co.," whose operations, after only a week or two's duration, have been ended this week by the Glasgow police. Glasgow was their headquarters, and we observed their advertisements in one of the mining papers, and it appears they also appeared in some Irish papers. Getting into communication with investors by these advertisements, which were always that they wanted to purchase good foreign Government bonds, &c., and with a good stock of cleverly written circulars or pamphlets, also offering far above the market prices for any bonds the investors had to sell, "Bond and Co." (well-chosen name) were opening a grand business. The investors, of course, jumped at the offer of 10*l.* or so per cent. above the market price for their bonds, and posted them right off to "B. and Co." to be sold. It is hardly necessary to say they never heard more of their bonds, the money, or from "B. and Co." thereafter. "B. and Co." simply sold the bonds and put the proceeds in their own pockets. Where "B and Co." now are is, therefore, the question. Our opinion is they have gone back to London again, and will vary their game by shortly sowing broadcast among the Scotch farmers, as "Stock, Share, and Co.," a circular with flaming particulars of that prolific mine, shortly to become the richest in Wales, now beyond all speculation, "The Bountiful Harvest Copper," "The Terrible Dividends Silver Lead Consols," or "The Wheal Bang Tin."

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Capital. Per share.	Paid up.	Dividends. Rate per cent. per annum. Previous.	Last.	Description of shares.	Last price.
				COAL, IRON, STEEL.	
£10	£8	£ 8½	£ 6½	Arniston Coal (Limited)	8
10	10	6	6	Benhar Coal (Limited)	6¾
10	10	6	6	Ditto	6¾
100	50	18s.9d.[1.41s.6d.		Bolckow, Vaughan, and Co. (Lim.)	A. 53¼
10	10	10	10	Cairntable Gas Coal (Limited)	9½
10	10	nil	—	Chillington Iron (Limited)	70s.
32	29	nil	nil	Ebbw Vale Steel, Iron, and Coal (Lim.)	8½
10	6	nil	nil	Fife Coal (Limited)	70s.
10	10	nil	nil	Glasgow Port Washington Iron & Coal (L)	32s. 6d.
10	10	—	—	Ditto Prepaid	32s. 6d.
10	10	—	—	Lochore and Capledrae (Limited)	50s.
10	10	nil	3	Marbella Iron Ore (Limited)	56s.
10	10	nil	nil	Monkland Iron and Coal (Limited)	47s. 6d.
10	10	5	4	Ditto Guaranteed Preference	90s.
100	100	nil	nil	Nant-y-Glo & Blaina Ironworks pref. (L)	19½
6	6	nil	nil	Omoa and Cleland Iron & Coal (L & Red.)	2s. 6d.
1	1	17½	15	Scottish Australian Mining (Limited)	37s. 6d.
1	8s.	17½	15	Ditto New	8s. 9d.
Stock	100	nil	nil	Shotts Iron	91
				COPPER, SULPHUR, TIN.	
4	4	—	—	Canadian Copper and Sulphur (Lim.)	3s.
10	7	40	40	Cape Copper (Limited)	36s.
1	1	15	7½	Glasgow Caradon Copper Mining (Lim.)	19s.
1	15s.	15	7½	Ditto New	15s.
10	9¾	nil	nil	Huntington Copper and Sulphur (Lim.)	5½s.
25s.	23s.	—	—	Kapunda Mining (Limited)	6d.
4	4	—	—	Panulcillo Copper (Limited)	30s.
10	10	6	6	Rio Tinto (Limited)	72s. 6d.
20	20	7	7	Ditto, 7 per cent. Mortgage Bonds	14½
100	100	5	5	Do. 5 p.ct. Mor. Deb. (Sp. Con. Bds.)	53½
10	10	nil	nil	Russia Copper (Limited)	40s.
10	10	22½	20	Tharsis Copper and Sulphur (Limited)	21½
10	7	29½	20	Ditto New	14¾
1	1	—	—	Yorke Peninsula Mining (Limited)	5s.
1	—	—	—	Ditto, 15 per cent. Guaranteed Pref.	17s. 6d.
				GOLD, SILVER.	
1	1	—	—	Australian Mines Investment (Limited)	8s. 9d.
5	5	7s. 6d.	7s. 6d.	Richmond Mining (Limited)	7½
				OIL.	
10	7	6	6	Dalmeny Oil (Limited)	8
1	1	7½	25	Oakbank Oil (Limited)	46s. 6d.
1	5s.	—	25	Ditto	12s.
10	10	2½	7½	Uphall Mineral Oil (Limited) "A"	9½
10	10	—	—	Ditto "B" Deferred	10
10	10	—	—	West Calder Oil (Limited)	75s.
10	8½	9	17½	Young's Paraffin Light & Mineral Oil (L)	14¾
				MISCELLANEOUS.	
50	25	5	6	London and Glasgow Engineering & Iron Shipbuilding (Limited)	25½
20	14½	—	—	Peruvian Nitrate (Limited)	10
7	7	20	10†	Phospho Guano (Limited)	10¾
10	10	6	6	Scottish Wagon (Limited)	11¼
10	4	6	6	Ditto New	87s. 6d.

† Interim. ‖ Per share.

Last day for this account, Nov. 10; settling day, Nov. 14.

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.

Post Office Buildings, Stirling, Nov. 1.

PORTABLE ENGINES.—The invention of Mr. C. N. MAY, of Devizes, relates to portable engines in which a boiler of the horizontal type or class, with cylinders and accessories, is mounted on wheels, and it consists in the combination with the engine as an integral part thereof of hoisting gear, so arranged as to be brought into, maintained in, and thrown out of action by means of frictional gearing or frictional clutches, with or without the aid of toothed gearing. According to one mode of carrying out the invention he mounts at the end of the smoke-box a barrel with the usual or other suitable hoisting gear or tackle, and arranges frictional gear or frictional clutches in connection therewith in such a manner that by the act of moving a lever or levers in one direction, the gear will be caused to engage, and motion thus imparted to the barrel in order to raise the load, while by moving the lever or levers in the opposite direction the gear will be disengaged and the load lowered, or the motion will be arrested and the load held in suspension according to the distance to which the lever or levers are moved. According to another mode of carrying out the invention he employs in combination with frictional gearing or frictional clutches toothed gearing, upon what is known as the sun-and-planet principle, the arrangement being such that by bringing a frictional clutch or brake into action, motion is transmitted through spur gearing to the barrel, and the load either raised or lowered as the case may be. He prefers to arrange the hoisting gear at the smoke-box end of the engine as before mentioned, but it may be placed at any other part which according to circumstances may be deemed more suitable.

BLAKE'S PATENT STEAM PUMP.

MORE THAN 10,000 IN USE.

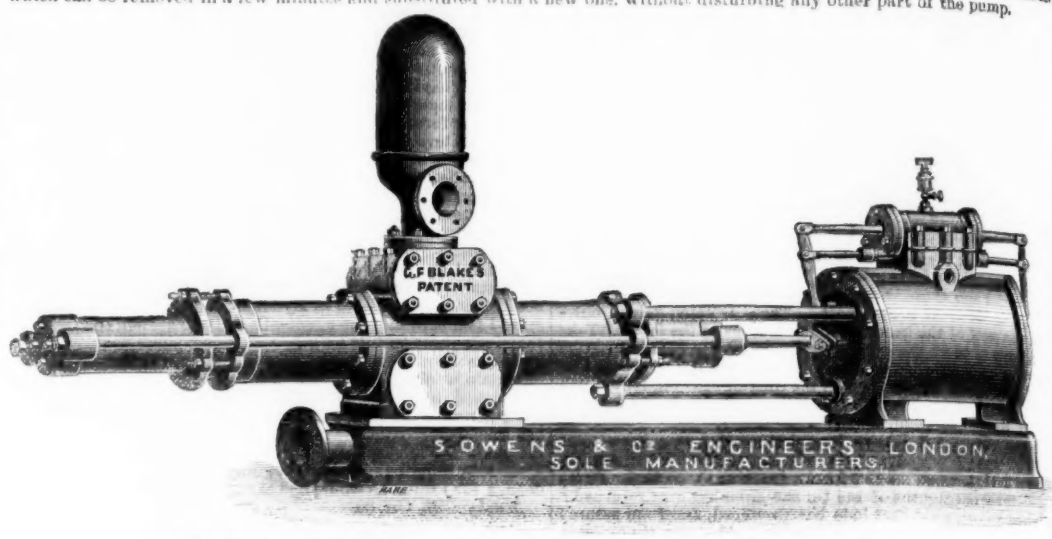
SOLE MAKERS FOR GREAT BRITAIN,

S. OWENS & CO.,

Hydraulic and General Engineers, Whitefriars-street, London;

Agent in Scotland: W. Hume, 195, Buchanan-street, Glasgow.

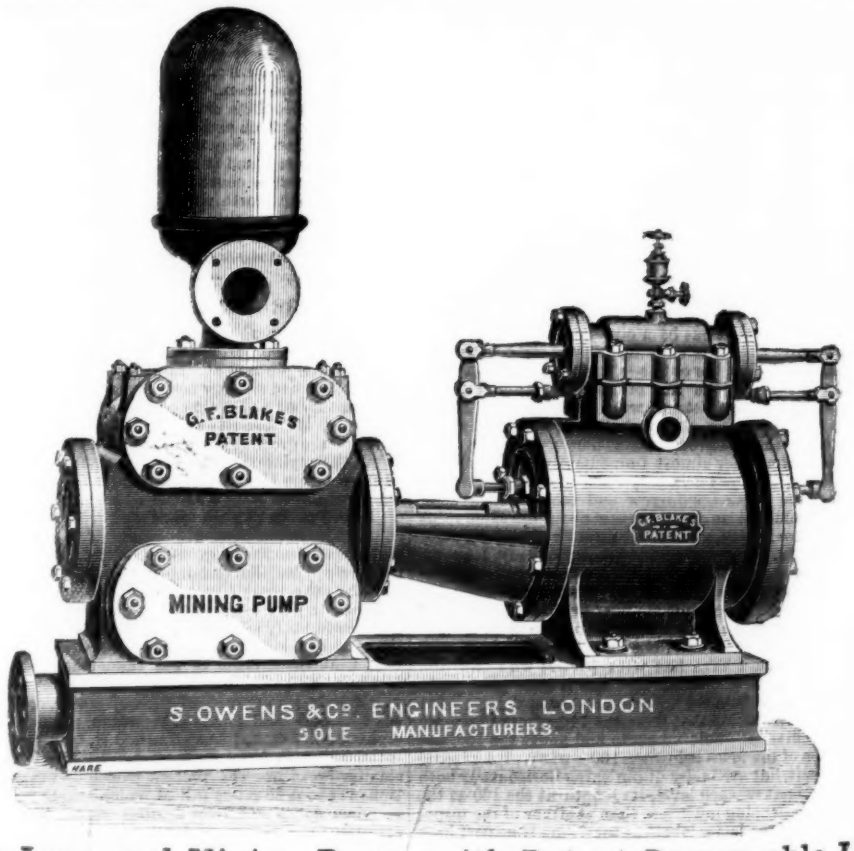
These PUMPS from their SIMPLICITY, RELIABILITY, DURABILITY, and ECONOMY are SPECIALLY SUITED FOR MINING PURPOSES, where large quantities of water require to be raised from great or medium depths with CERTAINTY. They are double-action in their construction, throwing a constant stream of water, can be made of any stroke to suit the space in which they have to work, can be arranged with any combination of steam and water cylinders to suit the pressure and lift against which it is desired to work them, are made of the very best materials and highest class of workmanship, and all working parts can be readily got at by any ordinary workman, and replaced if necessary by a duplicate part (all such being interchangeable) in the shortest possible time. For situations where gritty and sandy water has to be pumped the DOUBLE PLUNGER PATTERN is recommended. Where space is limited the PISTON PUMP is better suited, a novel feature of which is the PATENT REMOVEABLE LINING, which can be removed in a few minutes and substituted with a new one, without disturbing any other part of the pump.



Blake's Improved Double-plunger Steam Pump.

S. OWENS AND CO.,

In placing the BLAKE STEAM PUMP before the mining world, believe they are offering the BEST, MOST RELIABLE, and ECONOMICAL PUMP that has yet been made, and solicit an inspection of various sizes in operation at their works, Whitefriars-street, Fleet-street, London.



Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the SIZES SUITABLE FOR MINING PURPOSES:—

Dia. of steam cylinders.. In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24
Dia. of water cylinders.. In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6
Length of stroke ... ... In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17
Quantity in gallons per hour, approxmately ..	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15600	6720

PRICES FOR THE ABOVE, OR ANY SPECIAL SIZE, AND ILLUSTRATED CATALOGUES FURNISHED ON APPLICATION

PATENT CONDENSERS

Can be supplied for any size pump to effect a saving of fully 30 per cent. in the consumption of fuel, greatly increasing their efficiency

The Blake Pump will work under water, and as efficiently with compressed air as with steam.

BLAKE'S DONKEY PUMPS FOR FEEDING BOILERS KEPT IN STOCK.

AWARDED THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1876.

HADFIELD'S STEEL FOUNDRY COMPANY,

ATTERCLIFFE, SHEFFIELD,

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

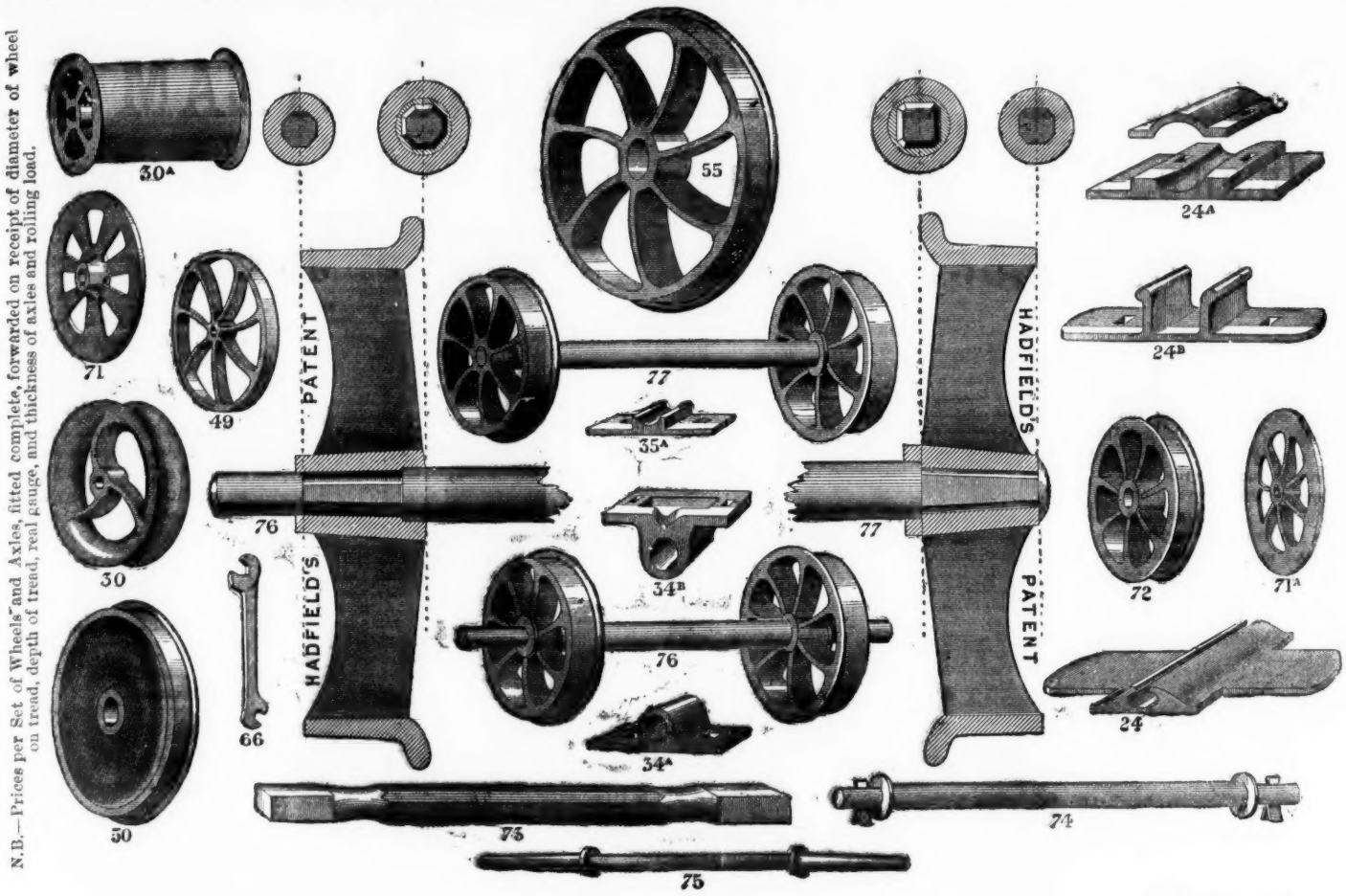
CRUCIBLE STEEL CASTINGS, for Engineering and Machine Purposes,

AND ARE THE SOLE MAKERS OF

HADFIELD'S CRUCIBLE STEEL WHEELS.

One of our departments is specially adapted for the manufacture of these Wheels (as shown below), for Collieries, Ironstone Mines, Slate Quarries, Ironworks, Lead Mines, &c., &c. We have made, and are now making, many HUNDRED THOUSANDS; and having Patented a New Method of Fitting Wheels upon axles, being cheap, effective, and expeditious, we can execute orders entrusted to us with promptitude, our capacity in this department alone being equal to about 2000 wheels per week.

N.B.—Prices per Set of Wheels and Axles, fitted complete, forwarded on receipt of diameter of wheel on tread, depth of tread, real gauge, and thickness of axles and rolling load.



[This Sheet of Drawings is Copyright.

HADFIELD'S PATENT METHOD OF FITTING WHEELS UPON AXLES.

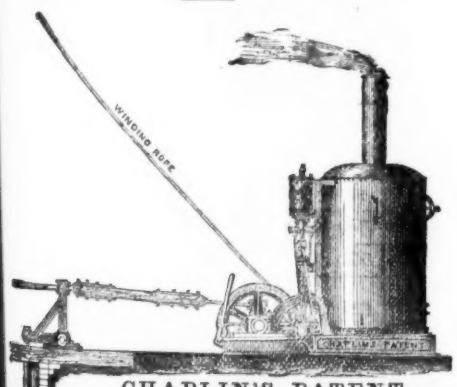
The advantages of the above system are that the Wheels being forced upon a Taper Square-ended Axle, by Machinery, and then riveted (the machine securing truth), it is impossible that they can come loose or get within gauge. They are very cheaply fitted on, and run exceedingly true.

We construct the Arms of wheels upon the curved principle (as shown in the drawings above), consequently the shrinkage or cooling of the Castings is not interfered with, thus securing the greatest advantages of our very strong material.

CRUCIBLE CAST-STEEL WHEELS, when cast by us, are made from one-third to one-half lighter than Cast-Iron. They cannot be broken while working, even with rough usage, and will wear at least twelve times as long as Cast-Iron, thus saving animal and steam power, and reducing wear and tear immensely.

We would also draw special attention to our INCLINE PULLEYS and CAGE GUIDES, the adoption of which will prove highly advantageous.

Prize Medal—International Exhibition, 1862.



CHAPLIN'S PATENT
PORTABLE STEAM ENGINES
FOR PUMPING AND WINDING.

SPECIALLY ADAPTED for PITS, QUARRIES, &c. SIMPLE and STRONG; require NO FOUNDATION or CHIMNEY STALK, and are EASILY ERECTED or REMOVED. Sizes, from 2 to 30-horse power.

Steam Cranes, 1½ to 30 tons, for railways, wharves, &c.; hoist, lower, and turn round in either direction by steam.

Stationary Engines, 1 to 30-horse power, with or without gearing.

Hoisting Engines, 2 to 30-horse power, with or without jib.

Contractors' Locomotives, 6 to 27-horse power.

Traction Engines, 6 to 27-horse power.

Ships' Engines, for winding, cooking, and distilling passed by H.M. Government for half water.

Steam Winches. Engines and Boilers for light screw and paddle steamers.

WIMSHURST, HOLLICK, & CO.,
ENGINEERS.

CITY OFFICES: 2, WALBROOK, LONDON, E.C.
WORKS: REGENT'S CANAL DOCK, 602, COMMERCIAL ROAD EAST, LONDON, E. [near Stepney Station.]

Just Published, Free Edition.

GUIDE TO HEALTH; or, ADVICE AND INSTRUCTIONS FOR THE CURE OF NERVOUS DEBILITY.—A New Medical Work on the Treatment of Local Debility, Consumption, Loss of Memory, Physical Depression, Indigestion, and all diseases resulting from loss of nerve power. Illustrated with numerous testimonials. Sent free for two stamps.—Dr. SMITH will, for the benefit of nervous patients, on receiving a description of their case, send a confidential letter of advice.

Address, Dr. H. SMITH, 8, Burton crescent, London, W. C.

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL, SHEAR, BLISTER, & SPRING STEEL.

MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS.
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

SHEAF WORKS AND SPRING WORKS, SHEFFIELD.

LONDON OFFICES.—35, QUEEN STREET, CITY. PARIS DEPOT—12, RUE DES ARCHIVES.
NEW YORK STORE—102, JOHN STREET.

RAILS FOR SALE.

Bridge Section, 10 to 25 lbs. per yard.
Flange Section, 16 to 70 lbs. per yard.
DH Section, 50, 60, to 70 lbs. per yard.
Steel Rails, 30, 36, 54, 58, to 66 lbs. per yard.

NEW PERFECT, NEW DEFECTIVE, AND SECONDHAND IN STOCK.

PERMANENT WAY RAILS, of all sections, made to order.

For sections and price, apply to—

ROBERT WRIGHTSON,
NEWPORT, MON.

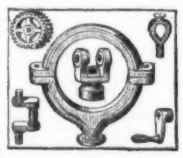
WILTON'S MATHEMATICAL INSTRUMENT ESTABLISHMENT,
REMOVED from St. Day to A. JEFFERY'S, CAMBORNE.

W. H. WILTON begs to thank his friends for their liberal support for so many years, and informs them that (having opened business at Valparaiso) he has now declined business in England in favour solely of Mr. A. JEFFERY, MATHEMATICAL INSTRUMENT MAKER, CAMBORNE, whom he considers (having been an assistant to his father for several years) is in every way capable of creditably maintaining the good name universally awarded to Wilton's instruments.

A. JEFFERY

Respectfully begs to inform Mine Managers, Surveyors, Engineers, &c., the having purchased Mr. Wilton's business, and the very valuable acquisitions and appliances belonging thereto, he has enlarged his Mathematical Instrument Manufactory, and is prepared to supply THEODOLITES, DIALS, POCKET DIALS, LEVELS, TRAVERSING and PLAIN PROTRACTORS, CASES OF DRAWING INSTRUMENTS, MEASURING CHAINS and TAPES, ASSAYERS' SCALES and WEIGHTS, ENGINE COUNTERS, and, in short, every description of Instruments used in SURVEYING, MEASURING, MAPPING, &c.

Repairing in all its branches promptly attended to.



MALLEABLE IRON CASTINGS,
Every Description.
W. B. MAPPLEBECK, JUN.,
21 AND 22, LOVEDAY STREET,
BIRMINGHAM.

G. HUTCHINSON AND CO.,
FORTH BANKS OIL WORKS,
NEWCASTLE-ON-TYNE,

Beg to draw the attention of COLLIERY OWNERS and ENGINEERS to the Oils prepared by their special process. They never clog nor corrode, but keep the bearings cool and clean, and will be found the best and most ECONOMICAL LUBRICANTS at present in the market, being very DURABLE, UNIFORM IN QUALITY, and CHEAP. Prices, from 2s.

SPECIALLY ADVANTAGEOUS RATES FOR LARGE CONSUMERS.

References to many eminent firms who have used them constantly for years, amongst whom may be mentioned Sir W. Armstrong and Co.; Elswick Engine and Ordnance Works, Newcastle; R. Stephenson and Co., Engineers, Newcastle; R. and W. Hawthorn, Engineers, Newcastle; Hawkes, Crawshay, and Sons, Engineers, Gateshead-on Tyne; Abbot and Co., Engineers, Gateshead-on-Tyne.

Samples, prices, &c., on application. AGENTS WANTED.

MR. W. F. STANLEY, MATHEMATICAL INSTRUMENT MANUFACTURER TO H.M.'S GOVERNMENT, COUNCIL OF INDIA SCIENCE AND ART DEPARTMENT, ADMIRALTY, &c.

MATHEMATICAL, DRAWING, and SURVEYING INSTRUMENTS of every description, of the highest quality and finish, at the most moderate prices.

Price-list post free.

ENGINE DIVIDER TO THE TRADE.

ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.C

PARIS INTERNATIONAL EXHIBITION, 1867.

VIENNA INTERNATIONAL EXHIBITION, 1873.

LONDON INTERNATIONAL EXHIBITION, 1874.

CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

TANGYE BROTHERS AND HOLMAN,

10, LAURENCE POUNTNEY LANE, LONDON, E.C.,

AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

The "SPECIAL" DIRECT-ACTING STEAM PUMP,

WITH

Holman's Patent Self-acting Exhaust Steam Condensers.

UPWARDS OF 12,000 "SPECIAL" STEAM PUMPS ARE IN USE.

After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is *no longer than the pump*. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.

Holman's Condenser

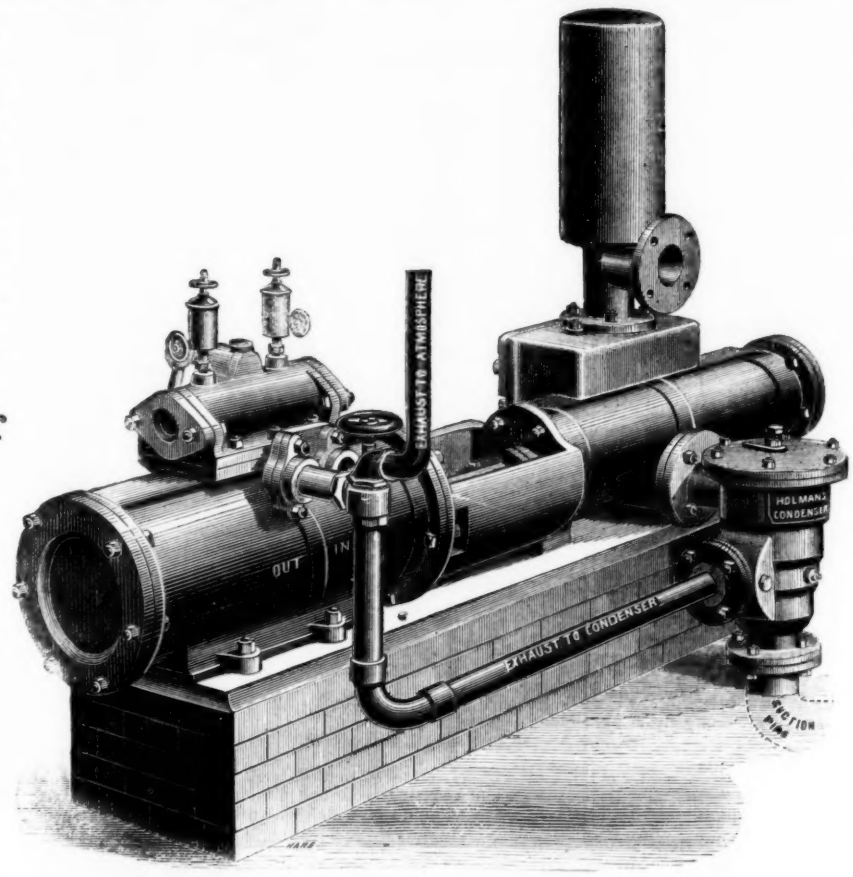
TURNS WASTE STEAM INTO GREAT POWER.

SAVES HALF ITS COST IN PIPES AND CONNECTIONS.

PREVENTS ALL ESCAPE OF STEAM IN MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

SAVES TWENTY TO FIFTY PER CENT. OF FUEL.



WILLIAM ELLIOT, Esq., *of the Weardale Iron and Coal Company, writes under date Sept.* 17th, 1875, *as follows:*—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers."

Messrs. BURT, BOULTON, and HAYWOOD, *Chemical Manufacturers, of London,* have FORTY of the "SPECIAL" STEAM PUMPS in use at their works.

HOLMAN'S CONDENSERS

Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	
Length of Stroke .....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	
Price of Special Pump ...£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18		
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12		
Length of Stroke .....In	12	18	24	24	18	18	18	24	24	24	24	[illegible]	24	24	24	24	24	24	24	24	24	24	24	24		
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000		
Price of Special Pump..£	65	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	190	210		
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	40	£40	£55	£55	£45	£45	£56		

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Stroke

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

NORLEY COLLIERY, WIGAN.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economical sense, a most valuable feature in the drainage of underground workings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10¾ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge indicating a steam pressure of 36 lbs. per square inch, 80 yards from the [illegible] and the Condenser vacuum gauge on the exhaust pipe indicating a steady [illegible] of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The [illegible] economy thus shown is really so great that the cost of the Condenser must [illegible] in a very short time.

(Signed) J. THOM[illegible]

NORTH OF ENGLAND HOUSE ... ... TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.
SOUTH WALES HOUSE... ... ... TANGYE BROTHERS AND STEEL, Tredegar Place, NEWPORT, Mon.; and Oxford Buildings, SWANSEA.

STEAM BOILERS

OF ALL KINDS MADE TO ORDER AT THE SHORTEST NOTICE BY THE

TURNBRIDGE IRON & BOILER WORKS COMPANY, LIMITED, HUDDERSFIELD.

London Agent—Mr. W. PARSEY, 46, FISH STREET HILL, E.C.

JOSEPH FENTON & SONS,

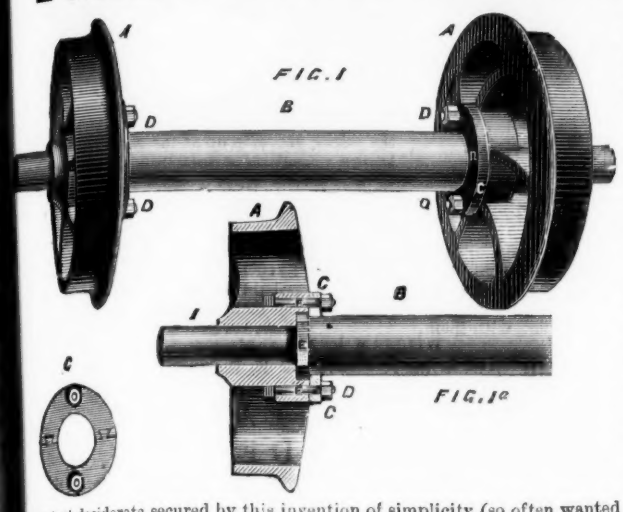
SYKES WORKS, SHEFFIELD, and 118, Cannon-street, LONDON, E.C.,

MANUFACTURERS OF

CRUCIBLE CAST STEEL CASTINGS,

HAVE PLEASURE IN CALLING THE ATTENTION OF THE MINING WORLD TO THEIR

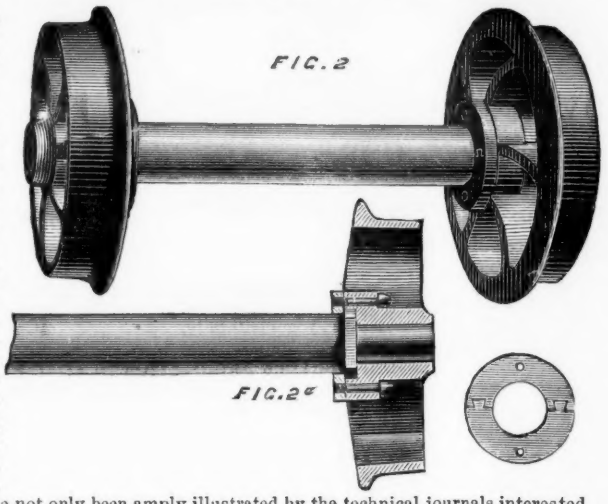
Patent Method of Fitting up Cast Steel Wheels and Axles.



Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings. A A, are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle. Figs. 2 and 2a show a longitudinal view and plan of a pair of corf wheels fitted up for inside bearings. The washers are secured to the boss of the wheel in outside bearings by bolts and nuts, and in inside bearings by set screws.

The advantages of the above system are:—A, the singular simplicity of fitting—enabling any inexperienced person, with the aid of a spanner or screw-driver, to detach the wheels from the axle or fit them together in a very short time. B, perfect solidity, the wheels and axles becoming as one piece. C, durability, no need or putting the wheels or axles into the fire, under any circumstances, which is so detrimental to wheels, rendering them remarkably brittle, and which under other systems are detached from the axle by the aid of fire. D, economy in fuel and wages, saving hundreds of pounds yearly to large coal owners. The important desiderata secured by this invention of simplicity (so often wanted in patents), solidity, durability, and economy, have not only been amply illustrated by the technical journals interested in the progress of mining operations in this country, but have at once been fully recognised by leading authorities in the mining world.



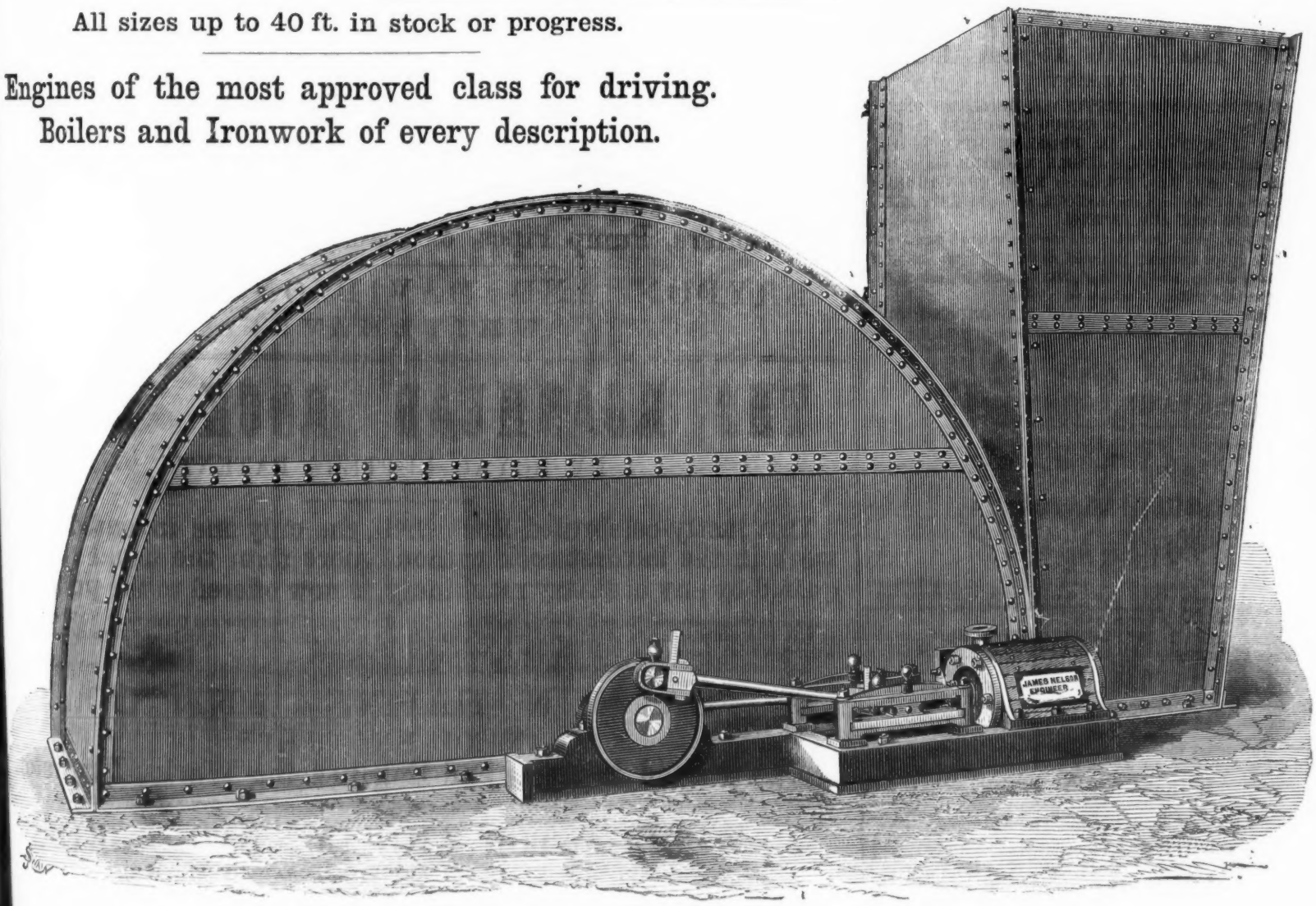
GUIBAL VENTILATING FAN

FOR COLLIERIES AND MINES.

PRICES AND PARTICULARS ON APPLICATION.

All sizes up to 40 ft. in stock or progress.

Engines of the most approved class for driving.
Boilers and Ironwork of every description.



MANUFACTURED BY

JAMES NELSON, Marine and Stationary Engine Works,

GATESHEAD-ON-TYNE.

H. R. MARSDEN, PATENTEE AND ONLY MAKER OF THE WELL-KNOWN BLAKE MACHINES,

ORE CRUSHERS AND STONE BREAKERS,

WITH THE

New Patent Reversible

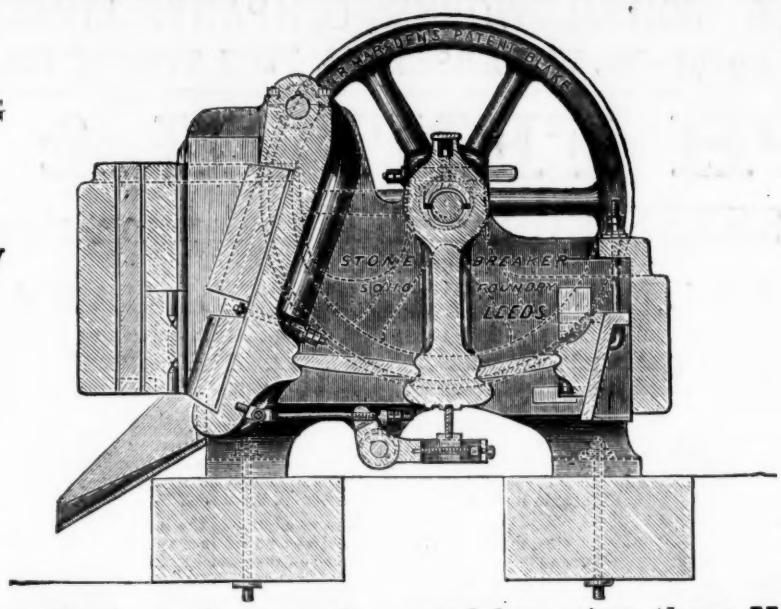
CRUSHING OR CUBING JAWS,

WHICH ARE CONSTRUCTED OF A PECULIAR MIXTURE OF METAL, WEARING

Four times longer than any other.

60 GOLD AND SILVER MEDALS.

OVER **2000** NOW IN USE.



For Crushing to any degr of Fineness, or Breakin to a required size.

Her Majesty's Governme

USE THESE MACHINES

EXCLUSIVELY

ALSO ALL THE GREAT

Mining Companies of t World.

H. R. M. has long observed the want of che machines,

STONE AND ORE CRUSHERS.

And has at length, by means of improved appli for the production thereof, been enabled to re the prices, yet keep up at the same time the known strength of construction. Reduced p on application.

FIFTY per Cent., and upwards, saved by using these Machines.

TESTIMONIAL FROM MESSRS. JOHN TAYLOR AND SONS.

6, Queen-street-place, May 10, 1877.

DEAR SIR,—We have adopted your Stone Breakers at many of the mines under our management, and are pleased to be able to state that they have in all cases given the greatest satisfaction. We are, yours faithfully, JOHN TAYLOR AND SONS.

H. R. Marsden, Esq.

Royal Agricultural Show, Liverpool, July, 1

DEAR SIR,—I have broken over 40,000 tons of very hard LIMESTONE into ROAD MET the Newport and other Road Trusts, in your PATENT STONE BREAKER, AND ALL ONE PAIR OF JAWS, which are STILL IN USE. I do not think at all, but am quite sur are the only Machines which fully perform the work you set them out to do, and there ar in the Show can at all compare with them. Yours, truly,

H. R. Marsden, Esq. WILLIAM PRICE, Contractor, Gold Cliff, Monm

INTENDING BUYERS ARE CAUTIONED AGAINST PURCHASING OR USING ANY INFRINGEMENT OF THE NUMEROUS PATENTS OF H. R. MARSDEN.

ILLUSTRATED CATALOGUES, TESTIMONIALS, and every information, on application to:—

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

ONLY MAKER OF SAULT'S PATENT SYPHON CONDENSER.

TO COLLIERY AND MINE OWNERS.

R. HUDSON'S PATENT STEEL CORVES OR "TRAMS."

Patented July, 1875, and January, 1877.

Entire new principle, saving three-quarters to 2 cwts. "dead" weight per corve. Will hold 2 to 3 cwts. more coal than the ordinary kind, *without increasing the outside dimensions.* Can also b as water tubs, and in thin seams are invaluable, as the height of the corves can be reduced without diminishing quantity of coal previously contained. In use, or on order, by the following coalow

Messrs. W. ACKROYD and BROS., Morley, near Leeds.
Messrs. CLAYTON and SPEIGHT, Farnley, near Leeds.
Messrs. JAS. WORMALD and SONS, Rawdon, near Leeds.
KINGSWOOD COAL AND IRON CO., near Bristol.
MIDDLETON COLLIERY CO., near Leeds.
FRYSTON COLLIERY CO. (Limited), Castleford, near Leeds.
HOWDEN CLOUGH COLLIERY CO. (Limited), near Leeds.
Messrs R. HOLLIDAY and SONS, Ardsley, near Wakefield.
HARDWICK COLLIERY CO., Clay Cross, near Chesterfield.
NEWTON COLLIERY, near Castleford.
WEST YORKSHIRE IRON AND COAL CO. (Limited), Tingley, near
WM. BAIRD and SON, Coatbridge, near Glasgow.
BETTISFIELD COLLIERY COMPANY, Bagillt, Wales.
EDFORD COLLIERY COMPANY, near Bath.
Messrs. RUSHFORTH and Co., Adwalton, near Leeds.
Messrs. JAS. FUSSELL, SONS, and Co., Frome, Somer
T. VAUGHAN and Co.'s TRUSTEES, South Medomsley Colliery; and others.

R. HUDSON, Engineer and Ironfounder, Gildersome Street Foundry, near Leeds *(Five minutes walk from Gildersome Station, G.N.R.)*

The Barrow Rock Drill COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY ONES that have been SUCCESSFULLY WORKED in the MINES of CORNWALL. At DOLCOATH MINE, in the HARDEST known ROCK, a SINGLE MACHINE has, since its introduction in July, 1876, driven MORE THAN THREE TIMES the SPEED of HAND LABOUR, and at TWENTY PER CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together, and at a proportionately increased speed. They are strong, light, and simple, easily worked, and adapted for ends and stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS, and all necessary appliances for working the said Drills.

Apply to—

LOAM AND SON,

LISKEARD, CORNWALL.

HEPBURNS' PUMP LEATHER WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

I. AND T. HEPBURN AND SONS,

TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,

LONG LANE, SOUTHWARK, LONDON

Prize Medals, 1851, 1855, 1862, for

MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM

(DAILY), and

SOUTH WALES GAZETTE

(WEEKLY), established 1857,

the largest and most widely circulated papers in Monmouthshire and South Wales

CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.

P. O. O. and cheques payable to Henry Russell Evans, 14, Commercial-street Newport, Monmouthshire.

THE IRON AND COAL TRADES' REVIEW.

The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron and coal districts. It is, therefore, one of the leading organs for advertising every description of Iron Manufactures, Machinery, New Inventions, and all matters relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.

Offices of the Review: 7, Westminster Chambers, S.W.

Remittances payable to W. T. Pringle.

BRYDON AND DAVIDSON'S ROCK DRI

SELECTED BY THE BRITISH AND OTHER GOVERNMENTS.

Reduced prices of this Rock Drill (formerly called "Kainotomon"), Nos. 1 and 2, £32 and £

SUBJECT TO DISCOUNT.

IMPROVED AIR COMPRESSORS.

Makers of Pumping and Winding Engines, Steam Hamm Boilers, Pump Pipes, &c., &c. Castings of all kinds.

BRYDON AND DAVIDSON, ENGINEER WHITEHAVEN.

THE ROANHEAD ROCK DRILL.

BY ROYAL LETTERS PATENT.

This justly-celebrated Rock Drill, the only one invented that wil work in the hardest rock without more than the usual repair re quired by any ordinary machine y, is now offered to the public.

It has been most successfully worked in the well-known Hematite Mines of Lancashire and Cumberland. Will drive 50 in hard rock without change of drill, and can be worked by any miner, and kept in repair by any blacksmith. It is simple rock drill ever invented, and cannot with fair usage get out of order.

Plans, Estimates, including Compressors, and all other Mining Machinery, supplied on application to the sole makers,—

SALMON BARNES AND CO.,

MINING ENGINEERS.

Canal Head Foundry and Engineering Works, Ulverston.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptio

STOURBRIDGE FIRE BRICKS AND CLAY.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors) at their offices, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*November 3, 1877.*